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VII. Distribution and Derivation of the Harvest

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VII. Distribution and Derivation of the Harvest

By Robert E. Munro
Charles F. Kimball

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Population Ecology of the Mallard
VII. Distribution and Derivation of the Harvest

by

Robert E. Munro and Charles F. Kimball

U.S. Fish and Wildlife Service
Migratory Bird and Habitat Research Laboratory
Division of Wildlife Ecology Research
Laurel, Maryland 20708

Abstract

This is the seventh in a series of comprehensive reports on population ecology of the mallard (*Anas platyrhynchos*) in North America. Banding records for 1961–1975 were used, together with information from previous reports in this series, to estimate annual and average preseason age and sex structure of the mallard population and patterns of harvest distribution and derivation. Age ratios in the preseason population averaged 0.98 immatures per adult and ranged from 0.75 to 1.44. The adult male per female ratio averaged 1.42. The young male per female ratio averaged 1.01. Geographic and annual differences in recovery distributions were associated with age, sex, and years after banding. Such variation might indicate that survival or band recovery rates, or both, change as a function of number of years after banding, and that estimates of these rates might thus be affected. Distribution of the mallard harvest from 16 major breeding ground reference areas to States, Provinces, and flyways is tabulated and illustrated. Seasonal (weekly) breeding ground derivation of the harvest within States and Provinces from the 16 reference areas also is tabulated. Harvest distribution, derivation, and similarity of derivation between harvest areas are summarily illustrated with maps. Derivation of harvest appears to be consistent throughout the hunting season in the middle and south central United States, encompassing States in both the Central and Mississippi flyways. However, weekly derivation patterns for most northern States suggest that early dates of hunting result in relatively greater harvest of locally derived mallards, in contrast to birds from more northern breeding areas.

This is the seventh in a series of reports on the population ecology of the mallard (*Anas platyrhynchos*). The report series uses a sequential approach whereby information presented in earlier reports is used for background and development in subsequent reports. The first report (Anderson and Henny 1972) discussed the history of waterfowl research and management in North America, reviewed previous mallard studies, and delineated 16 major and 44 minor reference areas for the breeding range of the mallard. The second report (Pospahala et al. 1974) discussed mallard breeding habitat conditions, breeding mallard populations, and productivity. Breeding population estimates, established according to reference areas given in the first report, are used in our report. Anderson et al. (1974) presented a bibliography of published literature on the mallard in the third report in the series.

The fourth report (Martin and Carney 1977) reviewed and summarized long-term hunting regulations, duck stamp sales, and harvest survey statistics with special reference to the mallard. Post-1960 harvest data were summarized by harvest area, State, and flyway. The fifth report (Anderson 1975) presented annual estimates of survival, band recovery rates, and harvest rates of the mallard in North America. These estimates were made for each age and sex category banded preseason in previously defined reference areas (Anderson and Henny 1972). The sixth report (Anderson and Burnham 1976) examined the effect of hunting on annual survival rates of the mallard.

The following objectives are addressed in this report:

- Estimate preseason age and sex structure of the continental population
- Compare for all age and sex categories the geographic distribution of recoveries from major reference areas
- Describe geographic distribution of the harvest among States and Provinces as indicated by band recoveries from each major breeding ground reference area
- Describe geographic and seasonal derivation of the harvest within each State and Province as represented by population-weighted band recoveries from the various breeding ground reference areas.

Several studies of the distribution of mallard band recoveries from various locations in the breeding range were

cited in Anderson and Henny (1972). However, using band recoveries to represent distribution and derivation of the harvest is more complex. Crissey (1955) discussed the problems associated with using banding data to determine waterfowl migration and distribution. Previous harvest distribution and derivation studies include those of Geis (1971, 1972) on mallards, Geis et al. (1971) on black ducks (*Anas rubripes*), Bowers and Martin (1975) and Bowers and Hamilton (1978) on wood ducks (*Aix sponsa*), and Stewart et al. (1958) and Geis (1974) on canvasbacks (*Aythya valisineria*).

Methods

Definition of Terms

Age at banding:

Adult — a bird known to have hatched before the calendar year of banding.

Immature — a young bird capable of sustained flight, hence not necessarily hatched in the vicinity of banding.

Local — a young bird incapable of sustained flight, thus hatched locally in the vicinity of banding.

Young — a bird known to have hatched during the calendar year in which it was banded (i.e., immature or local).

Band reporting rate — the proportion of banded birds taken by hunters that is reported to the Bird Banding Laboratory (see Henny and Burnham 1976).

Breeding population estimates — annual population estimates of adult birds in breeding reference areas, based primarily on aerial surveys (see Pospahala et al. 1974).

Breeding ground reference area — several preseason banding stations located in the same general area that display similar recovery distribution patterns (see Anderson and Henny 1972). Several of these areas (*SE Saskatchewan, SW Manitoba, Missouri River Basin,* and *Great Lakes* collectively) are used in this report to approximate the proposed Mid-Continent Waterfowl Management Unit (Office of Migratory Bird Management, personal communication).

Harvest — retrieved hunting kill.

Harvest areas — States and Provinces except (1) States from Montana south to New Mexico, which are split along a boundary between the Pacific and Central flyways, and (2) Central Flyway States from North Dakota south to Texas, which are split along the 100th meridian. The latter division separates the High Plains Mallard Management Unit from the rest of the Central Flyway, which we will refer to as the "Low Plains" (Hyland and Gabig 1980).

Harvest distribution — for each breeding ground reference area, the distribution of harvest (i.e., band recoveries adjusted for reporting rate).

Harvest derivation — for each harvest area, the derivation (sources) of harvest (i.e., band recoveries adjusted for reporting rate and weighted for population size).

Harvest rate — the proportion of the population harvested, estimated by dividing the recovery rate by the band reporting rate.

Harvest survey — the waterfowl questionnaire and wing-collection survey, collectively.

Hunting season — a variable period within the inclusive dates of 1 September through 15 February.

Hunting season shot (HSS) code — the number of hunting seasons that a bird survived before it was shot.

Preseason banding period — 1 July through 30 September, except when locally curtailed by early hunting seasons.

Preseason population — the population present during the preseason banding period. Preseason age and sex structure pertains to the population at the midpoint of the banding period.

Recovery — a banded bird killed or found dead and reported to the Bird Banding Laboratory.

Direct recovery — a banded bird recovered the first hunting season after banding (HSS-1).

Indirect recovery — a banded bird recovered in any hunting season following the first hunting season after banding (HSS2-N, as in 2nd through *N*th season).

Recovery rate — the proportion of banded birds that is recovered and reported to the Bird Banding Laboratory.

Waterfowl questionnaire surveys — annual questionnaire surveys, conducted independently by the United States Fish and Wildlife Service and the Canadian Wildlife Service, to estimate the harvest of major categories of waterfowl (e.g., ducks, geese).

Waterfowl wing-collection surveys — annual collections of wings submitted by hunters, which are used to estimate the species, age, and sex composition of the harvest.

Sources of Data

Banding and Recovery Data

Records of "normal wild" mallards banded preseason from 1961 through 1975 are used in this report. Selected recovery records include only birds shot or found dead during the 1961–75 hunting seasons that had been banded within the study years. These selections provided 697,530 banding records and 109,588 recovery records.

Breeding Population Surveys

Aerial surveys of waterfowl on their breeding grounds were initiated in 1947. These surveys have been described by Stewart et al. (1958) and discussed by Crissey (1957), Diem and Lu (1960), and Martinson and Kaczynski (1967). For 1955–1973, Pospahala et al. (1974) estimated that the aerial survey sampled an average of 84% of the North American mallard breeding population. Population estimates are available for mallards breeding in some areas

outside those covered by aerial surveys. These additional estimates are based on Provincial and State surveys and subjective estimates from waterfowl biologists (Pospahala et al. 1974). Mallard breeding population estimates used in this report are shown in Appendix Table A-1.

Band Reporting Rates

Henny and Burnham (1976) identified three factors, based on results of a recent reward band study, that influence band reporting rates: (1) band collecting by conservation officials, (2) distance of band recovery from the banding site, and (3) general intensity of banding effort relative to hunter success. Band reporting rate adjustments, which were applied only to recoveries that were submitted directly by hunters, are shown in Table A-2.

Harvest Surveys

From 1952 to 1960 the size and species composition of the waterfowl harvest in the United States were estimated through an annual mail questionnaire survey of waterfowl hunters. In 1961 the questionnaire survey was supplemented by a wing-collection survey, thus allowing a more direct estimate of (1) the species composition of the harvest (formerly obtained through the questionnaire), and (2) age and sex composition of the species harvested. Comparable information was not available for the Canadian waterfowl harvest until 1967. Details concerning the harvest surveys are presented in Martin and Carney (1977). Harvest survey data are used in this report to estimate (1) age and sex structure in the continental mallard population before the hunting season, and (2) harvest distribution for comparison with that shown by banding data analysis.

Procedures

Estimation of Annual Age and Sex Structure of the Preseason Population

Banding and recovery data, when used to estimate harvest derivation, require weighting to adjust for variation in populations and banding effort. We therefore need to estimate the preseason age and sex structure of the population to better utilize estimates of mallard numbers in the various breeding ground reference areas. This information, combined with banding effort, provides an estimate of the number of mallards represented by each banded bird as shown in the following procedures.

Breeding population estimates ($\hat{B}$) apply to an unknown mix of adult males and adult females. We need an estimate of the sex composition of the population because the sexes are not banded in proportion to their abundance, and are known to differ in likelihood of survival and other characteristics (Anderson 1975). We also need an estimate of the production of young in order to include young birds and adults in the harvest estimates. These needs are met by making "indirect population estimates" for each age and sex category. If we use an independent estimate of the total mallard harvest (H) provided by the harvest survey for year t, then an estimate of the continental preseason population (N_t) can be made for each year:

$\hat{N}_t = \hat{H}_t/\hat{h}_t$, where $\hat{h}_t$ is the total harvest rate for year t.

The total harvest rate for a given year is computed as the sum (over the 16 major reference areas) of the products of the harvest rate in year t from area i ($\hat{h}_{t,i}$) and the proportion of the continental breeding population estimate in year t from area i ($\hat{B}_{t,i}/\hat{B}_t$):

$$\hat{h}_t = \sum_{i=1}^{16} (\hat{h}_{t,i})\,(\hat{B}_{t,i}/\hat{B}_t)$$

If we let AM, AF, YM, and YF represent adult males, adult females, young males, and young females, respectively, then the equation for estimating the continental preseason population of adult males ($N_{t,\mathrm{AM}}$) for a given year is:

$$\hat{N}_{t,\mathrm{AM}} = \hat{H}_{t,\mathrm{AM}}/[\sum_{i=1}^{16} (\hat{h}_{t,\mathrm{AM},i})\,(\hat{B}_{t,i}/\hat{B}_t)] \qquad (1)$$

The age and sex structure defined by these indirect estimates (Equation 1) provided our estimate of the preseason age and sex structure of the continental population.

Each reference area is allocated a portion of the continental population corresponding to the size of its breeding population estimate:

$$\hat{N}_{t,\mathrm{AM},i} = [\hat{N}_{t,\mathrm{AM}}/\hat{N}_{t,(\mathrm{AM+AF})}]\,\hat{B}_{t,i}, \qquad (2)$$

where $i = 1, 2, \ldots, 16$ areas

$$\hat{N}_{t,\mathrm{AF},i} = [\hat{N}_{t,\mathrm{AF}}/\hat{N}_{t,(\mathrm{AM+AF})}]\,\hat{B}_{t,i} \qquad (3)$$

Assuming an even sex ratio for young birds (Bellrose et al. 1961; Anderson 1975) in the population,

$$\hat{N}_{t,\mathrm{YM},i} = \hat{N}_{t,\mathrm{YF},i} = \tfrac{1}{2}\,[\hat{N}_{t,(\mathrm{YM+YF})}/\hat{N}_{t,(\mathrm{AM+AF})}]\,\hat{B}_{t,i} \qquad (4)$$

Thus the age and sex structure of the population assigned to each reference area is the same as that of the continental population.

Assumptions inherent in the above formulations include (1) the populations remain unchanged during the preseason banding period; (2) the banded samples are representative of the populations with respect to mortality, movement, and migration; (3) the harvest area (United States) is large enough to include an adequate sample from all banded populations; (4) recruitment is uniform among all populations; (5) the adult sex ratio is uniform among all populations; and (6) band reporting rates are accurately estimated.

Unfortunately, movement (1) between the time of survey (May) and banding (July, August, and September) occurs to an unknown extent (e.g., Crissey 1955); banding (2) is not widespread within all reference areas; age and sex ratios (4, 5) vary over the breeding range, and band reporting rates (6) may not be accurately estimated (Conroy and

Williams 1981). However, we cannot obtain appropriate data for use in an alternative procedure, i.e., one that recognizes differences among breeding reference areas in population age and sex structure. Thus we are limited to the approach described in the above equations.

Estimation of Harvest and Harvest Rate of the Banded Sample

The harvest of banded birds and harvest rates of the banded samples are estimated as shown below, because all recovered bands are not reported. Let

$N'_{t,i}$ = the number of birds banded in year t, area i;
$R'_{t,i}$ = the number of birds banded in year t, area i, and recovered in the hunting season of year t;
$\hat{f}_{t,i}$ = the estimated recovery rate ($R'_{t,i}/N'_{t,i}$) of the banded sample in year t, area i; and
$\hat{\lambda}_t$ = the reporting rate for year t, as estimated by Henny and Burnham (1976).

The number of banded birds harvested ($\hat{H}'_{t,i}$) is estimated by the number of banded birds recovered divided by the reporting rate:

$$\hat{H}'_{t,i} = R'_{t,i}/\hat{\lambda}_t$$

The estimated harvest rate ($\hat{h}_{t,i}$) of the banded sample equals the recovery rate divided by the reporting rate:

$$\hat{h}_{t,i} = \hat{f}_{t,i}/\hat{\lambda}_t$$

Estimation of Harvest of the Population

Harvest estimation relies upon the relationship described by the Petersen estimate or "Lincoln Index." If we let

$\hat{N}_{t,i}$ = estimated number of birds in the ith population where $i = 1, 2, \ldots, 16$,
$\hat{H}_{t,i}$ = estimated number of birds harvested from the ith population,
$N'_{t,i}$ = number of banded birds in the ith population, and
$\hat{H}'_{t,i}$ = estimated number of banded birds harvested from the ith population, then

$$\hat{H}_{t,i}/\hat{N}_{t,i} = \hat{H}'_{t,i}/N'_{t,i} \qquad (5)$$

and

$$\hat{H}_{t,i} = \hat{H}'_{t,i}(\hat{N}_{t,i}/N'_{t,i}) \qquad (6)$$

Equation (6) emphasizes the concept of ($\hat{N}_{t,i}/N'_{t,i}$) as a "weighting factor" (Stewart et al. 1958; Geis 1972) by which the number of banded birds harvested, that were banded in area i, must be multiplied to give the total (banded and unbanded) harvest of birds from the population in area i. The weights are thus the estimated populations ($\hat{N}_{t,i}$) obtained from Equations (2) to (4) divided by the number of birds banded ($N'_{t,i}$).

However, we encountered substantial problems with this approach. Some population segments were not banded in some years and consequently could not be represented in the harvest. Small sample sizes (with large population weights) overwhelmed harvest derivation estimates based on preliminary results. An obvious and often used solution to both problems would be to eliminate small samples of banded birds, i.e., not include the breeding area.

We decided on an alternative approach to alleviate these problems. For each reference area we summed the breeding population estimate over the 15-year study period:

$$\hat{B}_i = \sum_{j=1}^{15} \hat{B}_{i,j} \text{ where } i = 1, 2, \ldots, 16 \text{ areas;}$$
$$j = 1, 2, \ldots, 15 \text{ years.}$$

We also summed, for each age and sex class, the numbers banded (N'_i) during the 15-year study period. Thus, for adult males we have

$$N'_{i,\mathrm{AM}} = \sum_{j=1}^{15} N'_{i,j,\mathrm{AM}}$$

Then the population weight for adult males from the ith area in the jth year is

$$W_{i,j,\mathrm{AM}} = \hat{B}_i\,[\hat{N}_{i,j,\mathrm{AM}}/\hat{N}_{i,j(\mathrm{AM+AF})}]/N'_{i,\mathrm{AM}} \qquad (7)$$

where the bracketed term is the proportion of adult males to total adults in the preseason population in the jth year. Calculations are similarly performed for the other age and sex classes. This procedure introduces errors in population weighting within individual years, but it greatly reduces variability in population weights among years. Population weights used in this study are shown in Table A-3.

Testing for Similarity in Band Recovery Distribution Patterns

The comparison of geographic distributions of band recoveries in this report has two major objectives: (1) to detect similarities or differences of significance to harvest management, and (2) to ascertain categories that may be combined (appear to be from the same population) and thereby obtain more reliable information as a result of larger sample sizes. Categories which may be examined with the above objectives in mind include (singly, or in selected combinations) banding locations, age, sex, year(s) of banding or recovery, direct and indirect recoveries, and calendar time of banding or recovery. For example, we may wish to compare the recovery pattern of immature male mallards banded in year i and recovered in year $i + 1$ (indirect recoveries) with the recovery pattern of adult male mallards banded and recovered in year i (direct recoveries).

In preliminary tests, we found that neither latitudes nor longitudes of band recovery were normally distributed. Thus we used a nonparametric test for our recovery distribution comparisons. The test (sometimes called the "Mardia–Watson–Wheeler" test or the "Uniform Scores" test) was originally proposed by Mardia (1967), although a special case of this general test was presented earlier by Wheeler and Watson (1964). The test is also discussed in

Mardia (1969*a*, 1969*b*, 1972:197–201) and Batschelet (1972: 80–82).

Briefly, this test involves computation of the centroid or center of gravity of the combined two-sample distribution. Vectors are then considered from this centroid through each sample point (latitude–longitude of band recovery), and the points are ranked based on the vector directions. These directions or angular observations are then replaced in the first sample by

$$C_i = 2\pi r_i/(n + m), i = 1, 2, \ldots, n,$$

where r_i is the linear rank of observation i, n is the number of observations in the first sample, and m denotes the number of observations in the second sample. We then compute the resultant or vector sum of the first sample as

$$R_I = [(\sum_{i=1}^{n} \cos C_i)^2 + (\sum_{i=1}^{n} \sin C_i)^2]^{1/2} \quad (8)$$

The null hypothesis of no difference between the two bivariate samples (i.e., two groups of recoveries exhibit the same geographic distribution pattern) is then rejected for large values of R_1. Mardia (1967) has shown that when $(n + m) > 17$ then

$$U = 2R_1^2 (m + n-1)/mn \quad (9)$$

is approximately distributed as X^2 with 2 df.

We required 20 recoveries in each group (n or m) as the smallest practical sample size with which to work. In many instances we combined recoveries across years to meet this criterion. In this manner we used years or year-groups as repeated measures within a major reference area. Although there is no completely satisfactory method of handling "ties" between observations from the two samples, approximate X^2 test statistics were computed in the manner suggested by Robson (1968). Continental statistics were obtained as $-2 \sum_{i=1}^{n} ln P_i$, where P_i denotes the probability associated with the individual test statistic of reference area i, and n denotes the number of reference areas available for the test (Sokal and Rohlf 1969:621–624). This statistic is distributed as X^2 with $2n$ df under the null hypothesis. We will refer to this procedure as the "centroid" test.

Describing Similarity in Harvest Derivation

Areas that derive their harvest from common production areas need to be identified. In this report we use "similarity indices" to compare sources of harvest for any two harvest areas. Similarity between two harvest areas is defined as the sum of harvest percentages that are derived from the same source areas. The index can range from 0 (completely independent in sources of harvest) to 100 (equal in percentages from all source areas). Hypothetical examples are illustrated in Table 1. The comparison of Areas B and C (Table 1) was especially intended to show that, although they have the same index (50) relative to A, this does not indicate similarity between B and C, which have an index of 0.

Results and Discussion

Preseason Age and Sex Structure in the Continental Population

Annual estimates of the preseason age and sex structure for the years 1961 through 1975 are presented in Table 2. The age ratio of young per adult averaged about 1.0, which agrees with earlier estimates (Bellrose et al. 1961; Anderson 1975). The average adult preseason sex ratio was 1.42 males per female.

Using survival and production rate (1.0) estimates for the 1961–1970 period, Anderson (1975) estimated an adult preseason sex ratio of 1.21 males per female using the method of Wight et al. (1965). However, Anderson's simulation

Table 1. Hypothetical example of similarity indices.

		Breeding ground reference areas								
Comparison		1		2		3		4		Total
Harvest area A:		25%		25%		25%		25%		100%
Harvest area B:		50%		50%		0%		0%		100%
Similarity index	=	25	+	25	+	0	+	0	=	50
Harvest area A:		25%		25%		25%		25%		100%
Harvest area C:		0%		0%		50%		50%		100%
Similarity index	=	0	+	0	+	25	+	25	=	50
Harvest area B:		50%		50%		0%		0%		100%
Harvest area C:		0%		0%		50%		50%		100%
Similarity index	=	0	+	0	+	0	+	0	=	0

Table 2. Preseason age and sex structure in the mallard population for the years 1961–1975.

Year	Proportion male[a] Adult	Young	Age ratio (young/adult)
1961	0.56	0.55	0.83
1962	0.54	0.50	1.16
1963	0.55	0.51	1.04
1964	0.62	0.50	0.85
1965	0.59	0.53	1.30
1966	0.57	0.47	1.07
1967	0.63	0.49	1.02
1968	0.59	0.49	0.75
1969	0.63	0.50	1.44
1970	0.60	0.53	0.86
1971	0.55	0.50	0.85
1972	0.60	0.54	0.75
1973	0.58	0.46	0.85
1974	0.62	0.48	1.26
1975	0.58	0.50	0.95
Average	0.59[b]	0.50[c]	0.98

[a]Structure was derived by dividing appropriate harvest estimate by the corresponding harvest rate (weighted on the basis of relative breeding population estimates).

[b]1.42 males/female

[c]1.01 males/female

work in that study led him to conclude that the adult preseason sex ratio ranged from 1.20 to 1.30 and might occasionally reach 1.35.

Johnson and Sargeant (1977), using a modification of Wight's method, simulated a final spring adult sex ratio of 1.26 males per female mallard for the period 1963–1973 in North Dakota's prairie pothole region. Spring through summer mortality rates averaged 16.4% for males and 28.5% for females. These interim mortality rates suggest a preseason sex ratio of 1.47. When Johnson and Sargeant (1977) modified their model for predictive purposes, they obtained an average spring sex ratio of 1.18, which they thought was more typical of the study period than the final simulated sex ratio of 1.26. Given the interim mortality rates used in their model, a spring sex ratio of 1.18 suggests a preseason sex ratio of 1.38. Martin et al. (1979) estimated an adult preseason sex ratio of 1.39 males per female using more current survival rate data (1961–1974) and a modification of the matrix population model developed by Leslie (1945, 1948).

Thus, the data used in this report suggest an adult preseason sex ratio that is somewhat higher than other estimates. However, it is unlikely that an overestimate of the ratio would cause an important bias in estimates of harvest derivation. The balanced sex ratio estimated for young birds in the preseason population provides additional support for the procedure and the resultant parameters.

Recovery Distribution Comparisons by Age, Sex, Type of Recovery, and Year

We tested for similarities in recovery distributions among various groups before we addressed distribution of the mallard harvest. For example, we could combine local and immature mallard bandings whenever recovery distributions were sufficiently similar. With this objective we made extensive and systematic use of the centroid test described earlier.

A test for similarity of recovery distributions is also affected by differences in banding intensity and location within a particular reference area. We used major reference areas as source areas to provide adequate sample sizes for analysis, but in the process we unavoidably added these sources of variability. Because of these additional sources of variation we disregarded significance at the 0.05 level in favor of significance at the 0.01 level. We are not inclined to speculate upon the biological significance of differences in recovery distributions unless the differences are independent of banding site sources of variation (e.g., the same cohort recovered in different years), prevalent in many areas, directionally (latitude or longitude) consistent, and supported by other evidence.

For statistical considerations we used recoveries that were not adjusted for band reporting rate. Use of adjusted recoveries, although biologically more meaningful, would have invalidated the tests.

Locals Versus Immatures

Recovery distributions of local and immature mallards were compared in four categories: (1) direct recoveries of males, (2) direct recoveries of females, (3) indirect recoveries of males, and (4) indirect recoveries of females. In each instance the continental test statistic was highly significant (Table 3). However, few differences between local and immature recovery distributions were detected across the important production areas of southern Canada (*SW Alberta, SW Saskatchewan, SE Saskatchewan*, and *SW Manitoba*). Test results for remaining major reference areas in which data were sufficient indicated significant differences ($P < 0.01$). Tests of direct recovery distributions indicated more difference between the age classes than did those of indirect recoveries.

Our results compare favorably with those of Anderson and Henny (1972). They found that the greatest difference in distribution between locals and immatures occurred in direct recoveries from bandings in the United States. They suggested that some of the immatures had migrated into the United States from more northern areas. However, earlier movement of the more physiologically advanced immatures away from banding areas cannot be discounted

Table 3. Summary of results of testing the hypothesis that local and immature mallards have similar recovery distributions.

Major reference area	Direct recoveries				Indirect recoveries			
	Male		Female		Male		Female	
	Test[a]	df	Test	df	Test	df	Test	df
SW Alberta	0.98	2	3.52	2	3.59	2		
SW Saskatchewan	10.87	4	7.17	4	7.09	4	5.24	2
SE Saskatchewan	1.19	2	7.30	2	1.84	2	2.83	2
SW Manitoba	13.32**	2	2.98	2				
E Ont - W Quebec	19.67**	4	17.68**	4				
Washington-Oregon	55.00**	2	46.77**	2	42.34**	2	44.59**	2
N California	3.87	2						
Intermountain	19.75**	2	13.36**	2				
High Plains	20.76**	6	27.98**	4	4.31	4	7.94	2
Missouri R. Basin	94.80**	6	96.52**	6	17.70**	6	26.70**	4
Great Lakes	316.13**	12	331.91**	12	67.49**	10	108.22**	10
Mid-Atlantic	28.99**	2	20.77**	2	0.56	2	2.64	2
NE United States	27.49**	2	42.58**	2	9.82**	2		
Continental total	540.53**	26	549.53**	24	119.59**	18	167.11**	14

[a]The test statistic is distributed approximately as X^2 with df = twice the number of comparisons included. Significance levels: $p<0.05$ not indicated, ** $p<0.01$. Greater detail is shown in Appendix Table B-1.

(J. B. Gollop, personal communication; Bellrose and Crompton 1970). We concluded that recoveries from the two age classes could not be combined because of the large differences between direct recovery distributions of local and immature mallards.

The local age class is not well represented by bandings and recoveries (Table B-1). Test statistics for 3 of the 16 major reference areas could not be obtained within our sample size constraints (n and $m \geq 20$) even with 15 years of banding data combined. We therefore excluded recoveries of mallards banded as locals from subsequent analyses.

Immatures Versus Adults

The same four categories were used to compare recovery distributions of mallards banded as immatures and adults. We again found large differences across most reference areas, which contributed to highly significant differences in the continental test statistics (Table 4). Recovery distributions of immature and adult males were different for both direct and indirect comparisons. Direct female recovery distributions also differed by age class.

With the notable exception of the *High Plains*, the prevailing difference was a more northerly distribution of immatures (Table B-2). J. B. Gollop (personal communication) noted that late-hatched locals were recovered closer to the banding site than were early-hatched locals. Jessen (1970) noted delayed migration from Minnesota of locally reared mallards and hens that had nested. He stated that locally reared mallards were especially vulnerable to local hunters. A prolonged attachment of the more vulnerable immatures to natal (i.e., northern) areas, perhaps related to later physiological development, could have caused the more northerly distribution of immature recoveries.

The extreme sensitivity of the centroid test is suggested by the significant difference ($X^2 = 74.29$, $P < 0.01$) between age classes of indirect females. Of all comparisons made, these recoveries should have revealed similar distributions (assuming that breeding habitat conditions were suitable) because of the strong homing tendency of females to natal areas (J. B. Gollop, personal communication; Sowls 1955; Lensink 1964; Jessen 1970). Examination of Table B-2 shows that for indirect females few within-reference area tests were significant, and that reference area test statistics were significant due to many small (statistically additive) differences which lacked directional (latitude or longitude) consistency. For example, in the indirect female column for the *E Ontario–W Quebec* reference area, the reference area statistic ($X^2 = 40.44$, $P < 0.01$) was significant in the absence of significant individual test statistics. This can be contrasted with the direct male column for the same reference area wherein the significant area test statistic ($X^2 = 105.82$, $P < 0.01$) reflects significant differences in 5 of the 12 individual tests (1965, 1968, 1971, 1972, and 1975).

Differences between immature and adult recovery distributions are most pronounced among male mallards, but

Table 4. Summary of results of testing the hypothesis that immature and adult mallards have similar recovery distributions.

Major reference area	Direct recoveries				Indirect recoveries			
	Male		Female		Male		Female	
	Test[a]	df	Test	df	Test	df	Test	df
N Pacific	0.14	2			0.06	2		
N Alta - N NWT	58.13**	8	19.81	8	36.75**	8	7.25	8
SW Alberta	66.43**	6	4.56	6	23.28**	6	5.07	6
SW Saskatchewan	77.24**	14	14.15	10	9.13	12	17.17	12
SE Saskatchewan	45.27**	8	3.45	6	9.64	8	1.72	2
SW Manitoba	96.23**	12	15.01	12	28.56**	10	10.75	10
N Sask-N Man-W Ont	4.38	2			1.69	4		
E Ont - W Quebec	105.82**	24	43.12**	24	149.25**	22	40.44**	22
Washington-Oregon	157.09**	14	132.30**	14	24.18	14	31.52**	12
N California	108.27**	16	41.69**	14	23.71	14	8.09	8
Intermountain	49.45**	12	16.06	10	39.82**	12	13.02	10
High Plains	206.65**	14	129.35**	14	109.01**	14	20.89	12
Missouri R. Basin	441.27**	16	111.60**	16	8.32	14	29.71**	14
Great Lakes	265.96**	30	133.49**	30	206.22**	28	50.57**	26
Mid-Atlantic	196.28**	16	120.54**	16	117.64**	14	24.62	12
NE United States	45.73**	12	15.18	14	35.56**	12	10.40	10
Continental total	1384.88**	32	455.83**	28	480.13**	32	74.29**	28

[a]The test statistic is distributed approximately as X^2 with df = twice the number of comparisons included. Significance levels: p<0.05 not indicated, ** p<0.01. Greater detail is shown in Appendix Table B-2.

they are of little biological significance beyond the first year among females. Relative similarity among recovery distributions of females provides some evidence that annual movements, including return to natal, migration, and wintering areas, are more stable and less prone to change than those of males. This suggests that females will effectively maintain long-term relationships through generations between breeding and wintering areas.

We concluded that we could not combine immature and adult recovery distributions due to the large continental test statistics for three of the four categories. However, we concluded that indirect immature female and indirect adult female recoveries could be pooled because the differences between these two groups were relatively small.

Males Versus Females

We made the following comparisons of males and females: (1) direct recovery of immatures, (2) direct recovery of adults, (3) indirect recovery of immatures, and (4) indirect recovery of adults. Once again all four categories yielded highly significant ($P < 0.01$) continental test statistics (Table 5). However, the differences in recovery distributions between males and females were less pronounced than, for example, immatures and adults. Only 6 of 15 reference area test statistics were significant ($P < 0.01$).

Data in Table B-3 demonstrate that *E Ontario–W Quebec, Missouri River Basin, Great Lakes,* and *High Plains* (to a lesser extent) were mostly responsible for the significant continental statistics. Within *E Ontario–W Quebec* most of the differences between indirect immature male and female recoveries were significant, and due almost entirely to a 3-5° mean longitudinal shift west by the males (assuming that most females returned to natal areas). To a lesser extent, this shift also occurred in the *Great Lakes* and *NE United States* reference areas. We believe that some males from the eastern edge of the breeding range become paired during the winter with females that home to areas farther west (toward the middle of the breeding range). These "displaced" males then migrate south toward the same wintering area, and pass through and become harvested in different areas.

When we next examined the large differences between indirect immature males and females from the *Missouri River Basin* (almost mid-continent), we expected to find males farther north (toward the middle of the breeding range) based on the previous explanation. Although the difference in latitude was consistent and more important than variation in longitude, we found that males were recovered farther south. If these differences related to banding site location, they should also have appeared within direct recoveries. Anderson (1975) provisionally concluded that the proportionately greater harvest of adult females in the north

Table 5. Summary of results of testing the hypothesis that male and female mallards have similar recovery distributions.

Major reference area	Direct recoveries: Immature Test[a]	df	Direct recoveries: Adult Test	df	Indirect recoveries: Immature Test	df	Indirect recoveries: Adult Test	df
N Pacific	2.50	2			6.50	2		
N Alta - N NWT	10.46	8	15.44	8	12.91	8	14.86	8
SW Alberta	9.60	6	1.97	6	0.51	6	22.68**	6
SW Saskatchewan	9.16	14	11.52	10	11.72	12	17.29	12
SE Saskatchewan	5.34	8	11.45	6	10.04	4	2.35	4
SW Manitoba	22.10	12	22.98	12	56.81**	10	16.87	10
N Sask-N Man-W Ont	6.67	6			12.90	6		
E Ont - W Quebec	39.90	24	56.02**	24	233.84**	22	73.60**	22
Washington-Oregon	30.13**	14	31.67**	14	16.04	14	24.65	12
N California	11.64	14	25.51	16	2.53	8	18.43	14
Intermountain	12.72	12	21.12	10	16.50	12	33.10**	10
High Plains	26.55	14	64.16**	14	12.95	12	78.51**	12
Missouri R. Basin	45.86**	16	43.17**	16	124.13**	14	91.95**	14
Great Lakes	51.50**	30	98.77**	30	379.80**	28	184.89**	26
Mid-Atlantic	44.16**	16	27.59	16	72.29**	14	11.48	12
NE United States	12.83	16	15.76	12	80.96**	14	11.76	10
Continental total	92.77**	32	162.68**	28	705.05**	32	318.34**	28

[a]The test statistic is distributed approximately as X^2 with df = twice the number of comparisons included. Significance levels: $p<0.05$ not indicated, ** $p<0.01$. Greater detail is shown in Appendix Table B-3.

reflected vulnerability more than occurrence. He suggested delayed molt, stresses of brood production, and the need for more feeding flights as possible factors causing greater vulnerability. The more pronounced differences within indirect recoveries of immatures, as opposed to direct or indirect recoveries of adults, could also reflect vulnerability if females are more vulnerable during their first year of nesting.

Martin and Carney (1977) suggested that adult males migrate south earlier and thus avoid early season hunting pressure. This is supported by Bellrose and Crompton (1970) who found hunters' bags composed entirely of adult drakes during the early fall. However, male mallards in Europe appear to migrate later than females (Lebret 1950; Mathiasson 1971; Ogilvie and Cook 1971).

The greater harvest of adult males in the South (Martin and Carney 1977) may be in part a result of the proportionately greater harvest of adult females in the North. Additional factors that might cause a more southerly distribution of males are hunter preference and regulations favoring the harvest of males. The sexes usually cannot be distinguished on the breeding grounds early in the season but can be distinguished later in the season (farther south). If these were major factors, however, they should have caused similar latitudinal differences between direct recoveries of the sexes, which were not apparent (Table B-3). The above factors may favor a more southerly distribution of males that was detectable only within indirect recoveries due to the accumulation of small differences over years.

We concluded that, for other than direct recoveries of immatures, the continental test statistics were sufficiently large to preclude combining males and females.

Direct Versus Indirect Recoveries

We again made four comparisons, two for each age and sex (Table 6). The effects of within-area variability in banding intensity and location were eliminated because we compared the distributions of direct recoveries with all subsequent (indirect) hunting season recoveries from the same banded samples (through 1975). Other than for adult females, most reference area test statistics were highly significant ($P < 0.01$).

The tabulation of within-reference area comparisons (Table B-4) documents an almost universal difference in mean latitude of recovery. Except for the *High Plains*, direct recovery distributions occurred farther north than indirect recoveries wherever a difference was detected ($P < 0.01$). The pattern was reversed for direct and indirect (farther north) recoveries from the *High Plains* because most birds were banded along the southern border of the reference area, particularly in the San Luis Valley. Previous work (Funk et al. 1971; Hopper et al. 1975, 1978) demonstrated the concentration of recoveries within the High Plains Mal-

Table 6. Summary of results of testing the hypothesis that direct and indirect recovery distributions of mallards are similar.

Major reference area	Adult recoveries Male Test[a]	df	Adult recoveries Female Test	df	Immature recoveries Male Test	df	Immature recoveries Female Test	df
N Pacific					20.31**	2	7.55	2
N Alta - N NWT	9.73	8	5.07	8	82.99**	8	37.09**	8
SW Alberta	25.88**	6	1.84	4	70.32**	6	12.36	6
SW Saskatchewan	25.06	12	19.32	10	89.10**	12	31.29**	12
SE Saskatchewan	21.80**	8	4.45	4	41.28**	8	0.41	2
SW Manitoba	46.19**	10	17.89	10	170.22**	10	35.57**	10
N Sask-N Man-W Ont	10.45**	2			55.57**	6	12.87	6
E Ont - W Quebec	132.17**	22	66.17**	22	985.85**	22	199.11**	22
Washington-Oregon	26.43	14	31.55**	12	188.93**	14	116.51**	14
N California	23.56	14	23.95	14	61.23**	14	7.55	8
Intermountain	30.16**	12	21.45	10	28.71**	12	12.06	12
High Plains	99.33**	12	49.21**	12	257.56**	12	152.43**	12
Missouri R. Basin	69.99**	14	24.58	14	548.17**	14	43.08**	14
Great Lakes	89.27**	28	76.02**	26	987.12**	28	159.72**	28
Mid-Atlantic	39.28**	14	30.59**	12	398.18**	14	116.14**	14
NE United States	13.25	10	20.42	10	352.46**	14	60.25**	14
Continental total	343.10**	30	148.57**	28	2554.46**	32	635.15**	32

[a]The test statistic is distributed approximately as X^2 with df = twice the number of comparisons included. Significance levels: $p<0.05$ not indicated, ** $p<0.01$. Greater detail is shown in Appendix Table B-4.

lard Management Unit, of which the *High Plains* breeding ground reference area is a part.

Although the mean latitudinal differences were variable in magnitude and often considerably less important than those for mean longitude, the underlying consistency (and direction) must be examined. We believe that the most logical explanation for this difference, which spans age and sex classes and most portions of the breeding range, is the greater association of direct recoveries with banding sites (assuming a general north to south movement from summer to winter areas). Areas of quality habitat attract large numbers of ducks, which attract both banders and hunters. Some of these birds, particularly young of the year and adult females, remain in the general vicinity of the banding site until southward migration begins. This causes a concentration of recoveries near banding sites that affects, and is a portion of, the total distribution of direct recoveries. Indirect recovery distributions do not show the same degree of concentration near banding sites. Annual variation in breeding habitat conditions displaces some birds; this causes a more scattered distribution of indirect recoveries that is centered farther south than a comparable distribution of direct recoveries. Both distributions may be very similar geographically, but the direct recovery distribution includes a higher proportion near the banding site.

Age is also a factor in comparisons of direct and indirect recoveries. Birds banded as immatures return the following summer as adults, and those banded as adults return a little older and perhaps more experienced. The timing or rate of movement may be somewhat different in older birds, or variation in early fall weather conditions may promote a more scattered distribution of indirect recoveries. These differences are more pronounced for males than for females which, because of homing, are expected to have similar distributions in successive years.

Direct versus indirect recovery distribution comparisons are illustrated in Fig. 1 for the *Missouri River Basin.* Although only significant ($P < 0.01$) mean latitude or longitude differences are shown in Table B-4, the actual centers of recovery distributions are plotted in Fig. 1. Only one point was plotted for each direct or indirect adult female recovery distribution, because only one significant ($P < 0.01$) difference was detected. However, seven points were plotted for each direct or indirect immature male recovery distribution, because seven differences were found between them. Direct recoveries of immatures were centered the farthest north, followed by direct adult and indirect immature females, direct adult males and indirect adult females, and finally indirect males. Within an age–sex class, direct recovery distributions were almost always centered farther north than indirect recoveries. Indirect males were the only recovery distributions centered south of the reference area (40°N).

We previously suggested that westward shifts by males

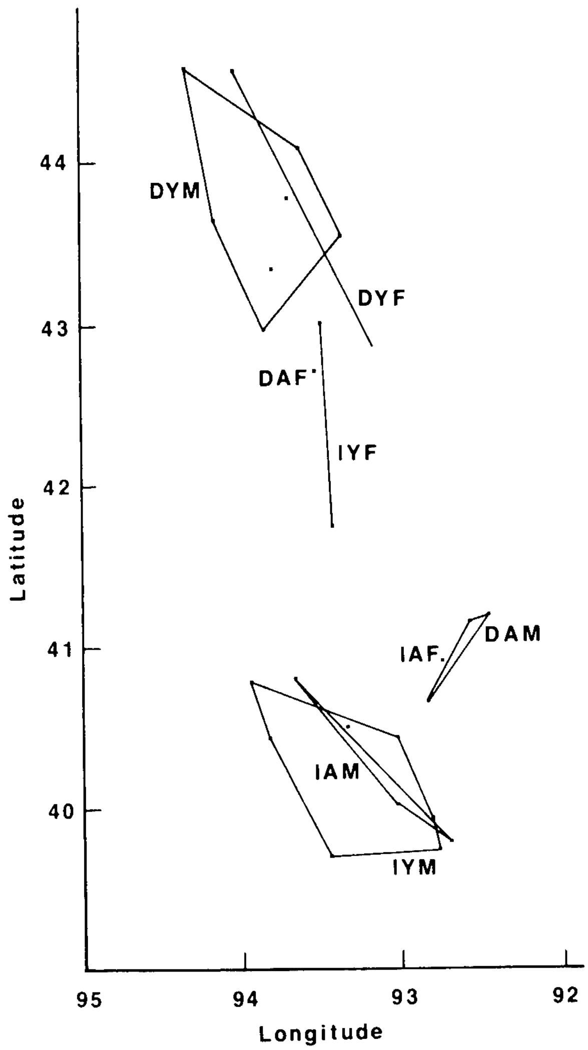

Fig. 1. Comparison of direct (D) and indirect (I) recovery distributions of immature (Y), adult (A), male (M), and female (F) mallards banded preseason in the *Missouri River Basin*. Points represent significantly different ($P < 0.01$) geographic centers of recovery distributions from year-group comparisons shown in Table B-4. Of seven comparisons made for each age-sex class, all were different for immature males; hence seven points are illustrated for both direct immature males (DYM) and indirect immature males (IYM). Lines serve only to connect or surround points representing a given age–sex class. The southern boundary of the reference area lies in part along 40°N latitude.

are probably due to pair formation on the wintering grounds with females from the central part of the range. This explanation is also appropriate when direct and indirect recoveries of immature males are compared. Indirect recoveries of immature males banded in eastern reference areas were centered several degrees west of direct recoveries. Similarly, immature males that were banded in the west and survived their first hunting season were recovered farther east.

Our results compare favorably with previously reported differences between direct and indirect recoveries (Lensink 1964; Geis et al. 1971; Anderson and Henny 1972; Hopper et al. 1978; March and Hunt 1978). Although direct and indirect recovery distributions of adult females were statistically different ($X^2 = 148.57, P < 0.01$) at the continental level, differences were found in only 5 of the 16 major reference areas (Table 6). We concluded that, except for adult females, we could not combine direct and indirect recoveries.

Direct Adults Versus Indirect Immatures

An immature mallard that survives its first hunting season enters its second calendar year as an adult. Subsequent indirect recovery distributions of birds banded as immatures might be similar to direct recovery distributions of adult-banded birds. Table 7 presents comparisons of direct adult and indirect immature recoveries for each sex (indirect adults and immatures were previously compared). The continental test statistics for both sexes were highly significant ($P < 0.01$), although differences within males were much more pronounced. The most pronounced difference was a more westward distribution for immature males banded in the East (Table B-5). We concluded that direct adult and indirect immature female recoveries represented the same population and could be combined because differences within females were detected in only 5 of 16 major reference areas.

Direct Recovery Distributions During Consecutive Years

In previous analyses of direct recovery distributions we used years or groups of consecutive years as repeated measures within reference areas, which tended to minimize any effect of annual variation. Here we examined the extent of annual (or year-group) variation in direct recovery distributions within each age and sex class (Table 8). Once again we found highly significant ($P < 0.01$) differences in recovery distributions from one year to the next, as measured by continental test statistics for the four age–sex classes examined. Immature males displayed the greatest year-to-year variation in distribution.

Fortunately, trends or consistencies were not detected within reference areas (Table B-6). For example, immature male test statistics within the *Great Lakes* area, which demonstrated the largest difference, showed no consistent directional differences in mean latitude–longitude of recovery distribution. Between-year comparisons are affected by changes in banding sites, breeding ground habitat, migration chronology, migration and winter habitat conditions, hunting pressure, hunting regulations, and other factors. Between-year comparisons of direct recovery distributions showed no consistent latitude or longitude differences within reference areas (Table B-6); therefore, we combined the 15 years of banding and recovery data.

Table 7. Summary of results of testing the hypothesis that direct recovery distributions of birds banded as adults are similar to indirect recovery distributions of birds banded as immatures.

Major reference area	Male Test[a]	Male df	Female Test	Female df
N Alta - N NWT	24.68**	8	12.77	8
SW Alberta	5.14	6	1.26	4
SW Saskatchewan	10.73	12	13.59	10
SE Saskatchewan	16.02	8	2.37	4
SW Manitoba	97.59**	10	10.46	10
N Sask-N Man-W Ont	8.23	2		
E Ont - W Quebec	382.73**	22	98.64**	22
Washington-Oregon	30.26**	14	20.31	14
N California	14.13	14	2.96	8
Intermountain	54.03**	12	10.38	10
High Plains	35.47**	12	45.38**	12
Missouri R. Basin	52.48**	14	17.35	14
Great Lakes	318.46**	28	99.37**	28
Mid-Atlantic	197.99**	14	82.55**	14
NE United States	69.35**	12	30.68**	14
Continental total	924.18**	30	196.47**	28

[a]The test statistic is distributed approximately as X^2 with df = twice the number of comparisons included. Significance levels: $p<0.05$ not indicated, ** $p<0.01$. Greater detail is shown in Appendix Table B-5.

Table 8. Summary of results of testing the hypothesis that direct recovery distributions of mallards are similar during consecutive years or groups of years.

Major reference area	Adult recoveries: Male Test[a]	df	Adult recoveries: Female Test	df	Immature recoveries: Male Test	df	Immature recoveries: Female Test	df
N Alta - N NWT	5.94	6	2.74	2	20.61**	6	4.03	4
SW Alberta	1.25	4	0.26	2	4.27	4	1.13	2
SW Saskatchewan	30.57**	8	1.66	2	19.19**	6	8.56	6
SE Saskatchewan	14.70**	4	0.72	2	22.84**	4	4.32	4
SW Manitoba	17.00**	6	11.41	6	51.62**	6	17.95**	6
N Sask- N Man-W Ont					24.57**	4	0.71	2
E Ont - W Quebec	16.45	12	13.04	12	65.94**	12	76.56**	12
Washington-Oregon	12.54	8	22.40**	6	32.18**	8	9.36	8
N California	11.87	8	21.39**	8	108.38**	8	51.97**	6
Intermountain	27.01**	6	28.49**	4	88.85**	6	31.29**	6
High Plains	85.38**	6	59.91**	6	79.95**	6	80.42**	6
Great Lakes	25.34	14	89.93**	14	209.08**	14	90.46**	14
Mid-Atlantic	24.79**	8	44.05**	8	46.20**	8	42.44**	8
NE United States	11.47	4	6.41	6	26.70**	8	18.93	8
Continental total	176.98**	28	195.74**	28	612.49**	30	301.36**	30

[a]The test statistic is distributed approximately as X^2 with df = twice the number of comparisons included. Significance levels: $p<0.05$ not indicated, ** $p<0.01$. Greater detail is shown in Appendix Table B-6.

Table 9. Summary of results of testing the hypothesis that mallards banded during consecutive years or groups of years have similar indirect recovery distributions.

Major reference area	Adult recoveries				Immature recoveries			
	Male		Female		Male		Female	
	Test[a]	df	Test	df	Test	df	Test	df
N Alta - N NWT	12.46	6	2.72	2	9.39	4	4.95	2
SW Alberta	6.99	2	0.03	2	3.33	2	0.64	2
SW Saskatchewan	27.79**	8	1.59	4	5.82	6	2.03	4
SE Saskatchewan	4.39	4			7.25	4		
SW Manitoba	12.23	6	1.88	4	8.10	6	13.20	4
N Sask-N Man-W Ont					18.80**	4	1.35	2
E Ont - W Quebec	13.91	10	18.57	10	17.32	10	27.78**	10
Washington-Oregon	15.62	6	38.75**	6	8.08	8	19.11**	6
N California	7.65	6	4.52	6	5.69	6	7.79	2
Intermountain	24.00**	6	3.20	4	38.19**	6	31.18**	6
Missouri R. Basin	18.86	8	19.86	8	11.45	8	8.73	8
Great Lakes	13.47	14	13.39	12	35.39**	14	22.04	14
Mid-Atlantic	10.84	6	7.58	6	3.92	6	14.33	6
NE United States	10.47	6	1.31	4	11.36	6	4.36	6
Continental total	130.97**	28	90.57**	26	109.62**	30	94.65**	28

[a]The test statistic is distributed approximately as X^2 with df = twice the number of comparisons included. Significance levels: $p<0.05$ not indicated, ** $p<0.01$. Greater detail is shown in Appendix Table B-7.

Indirect Recovery Distributions During Consecutive Years

We compared indirect recovery distributions of birds banded in consecutive years, or groups of years, within reference areas and within age–sex classes (Tables 9 and B-7). In contrast to the direct recovery comparisons discussed above, indirect recoveries of birds banded in consecutive years often occurred in essentially the same hunting seasons. For example, here we compared mallards banded in 1961 and recovered during 1962–75 with mallards banded in 1962 and recovered during 1963–75. Numerous small but significant differences ($P < 0.01$) were detected in some reference areas and all age–sex classes. Their combined effect yielded significant X^2 test statistics at the continental level. However, magnitudes of these X^2 values were substantially less than corresponding statistics for direct recovery distributions during consecutive years. We concluded that these data provide further justification for combining banding and recovery data across years.

Summary of Age, Sex, Type of Recovery, and Between-year Comparisons

We found large differences between recovery distributions of local- and immature-banded mallards, particularly in northern U.S. major reference areas. We therefore excluded local-banded mallards from further analysis. Significant differences were also found between immature and adult, male and female, direct and indirect, and annual recovery distributions.

Direct recovery distributions of immatures and females were generally centered farther north (closer to banding sites) than those of adult males. Direct recovery distributions of any age–sex class, because of the concentration of direct recoveries near banding sites, were almost always centered farther north than respective indirect recovery distributions. Indirect recovery distributions of immature males were centered nearer the middle of the breeding range than respective direct recovery distributions.

We concluded that distribution and derivation of the mallard harvest could be described using four sets of data: (1) direct adult males, (2) adult females (direct and indirect adult, and indirect immature females), (3) direct immatures, and (4) total (i.e., all age [locals excluded], sex, and recovery types). However, the fourth category also includes indirect recoveries of immature- and adult-banded male mallards, which are not included in the other categories.

Recovery Date Comparisons

Dates on which mallards were harvested during the hunting seasons present an additional means of comparing age–sex classes. We first modified recovery dates so that 1 September was represented by Day 1. Then for each major ref-

Table 10. Summary of results of testing the effects of recovery type (R), age at banding (A), and sex (S) on recovery dates of mallards from major reference areas.[a]

Major reference area	Parameters, estimates (days), and significance tests													
	Rec. type		Age		Sex		R * A		R * S		A * S		R*A*S	
(number of recoveries)	est.	p>t	est.	p>t	est.	p>t	est.	p>t	est.	p>t	est.	p>t	est.	p>t
N Pacific (198)	-23.3	**		ns		ns		ns		ns		ns		ns
N Alta - N Nwt (1950)	-9.1	**		ns		ns	16.0	**	6.6	*	-9.8	**		ns
SW Alberta (1914)	-7.9	**		ns	-5.0	**	20.9	**		ns		ns		ns
SW Saskatchewan (5401)	-5.4	**	4.1	**	-2.9	**	9.5	**		ns	-5.8	**		ns
SE Saskatchewan (1510)	-8.3	**	6.8	**	-4.9	*		ns	-8.6	*		ns	-22.1	**
SW Manitoba (4034)	-11.1	**	5.6	**	-4.8	**	9.0	**		ns		ns	-11.7	**
N Sask-N Man-W Ont (844)	-13.1	**		ns		ns		ns		ns		ns		ns
E Ont - W Que (10110)	-14.9	**	5.9	**	-6.9	**	5.4	**		ns	-3.6	*		ns
Washington - Oregon (5893)	-12.3	**	6.8	**	-3.7	**	8.4	**		ns	-5.0	**		ns
N California (3342)	-12.3	**	10.1	**	-3.4	**	9.6	**	-5.4	*		ns		ns
Intermountain (4131)	-8.4	**	5.4	**	-3.3	**	8.5	**	4.2	*		ns		ns
High Plains (6744)	-13.1	**	5.8	**	-7.2	**	5.8	**	5.4	**	-4.1	*		ns
Missouri R. Basin (11960)	-6.9	**	6.8	**	-6.4	**	8.6	**	8.0	**		ns	-9.7	**
Great Lakes (15808)	-8.1	**	7.0	**	-7.8	**	10.5	**	6.9	**	-3.0	**	-8.9	**
Mid-Atlantic (4980)	-6.4	**	5.5	**	-4.7	**	3.6	*		ns	-4.2	**		ns
NE United States (3743)	-7.5	**	4.0	**	-4.1	**		ns		ns		ns		ns

[a]Two levels of each main effect were compared; recovery type (direct - indirect), age at banding (adult - immature), and sex (female - male). Parameter estimates (est.) are shown only for effects that were significant (* p>t = 0.05; ** p>t = 0.01). Lack of significance is indicated by "ns". The interaction between the effects of recovery type (R) and age (A), for example, is shown as "R * A".

erence area we examined the effects of type of recovery (direct or indirect), age at banding (adult or immature), and sex (male or female) on recovery dates. As used here, type of recovery is a measure of age.

There were consistent effects of recovery type, age at banding, sex, and interactions among main effects within most reference areas (Table 10). For example, a significant interaction between recovery type and age (R*A) simply means that the effect of recovery type was not the same over all ages, or vice versa. Direct recoveries generally occurred earlier during the hunting season than indirect recoveries. Mean recovery dates for immatures were earlier than dates for adults, and females were recovered earlier than males.

We combined recoveries from bandings in all areas and repeated the analysis (Table 11) because the parameter estimates did not vary greatly from one reference area to the next. All main effects and interactions were again highly significant, with parameter estimates of similar magnitude.

As an extension of our recovery date analysis, we subdivided indirect recoveries into HSS-2 (birds harvested during their second hunting season after banding) and HSS3-N classes (Table 12). Most of the interaction terms were not significant, but differences due to recovery type, age, and sex were still found within most reference areas. We again combined recoveries from all reference areas (Table 13). Parameter estimates were generally smaller but directionally consistent with previous results. The largest detected differences were between females and males (8.4 days) and recovery type (3.3 days).

Recovery date differences were consistent within age–sex classes (Table 14). For birds banded as immatures, HSS3-N recoveries occurred at a significantly later date than HSS-2 recoveries, which in turn occurred at a significantly later date than direct (HSS-1) recoveries. Birds banded as adults showed the same pattern, but not to the same extent.

There are apparent differences in dates of recovery beyond the first year after banding and, quite possibly, distributional differences. We can only speculate on the importance of these differences, since Botkin and Miller (1974) concluded that the prevailing hypothesis of constant annual mortality among adult birds (age-independent) was questionable. With few exceptions (e.g., Model H3 in Brownie et al. 1978:80), survival rate estimation requires the assumption that survival and recovery rates are age-dependent only for the first year of life. Differences in dates of recovery and geographic distribution raise the possibility that survival or recovery rates may also change as a function of years after banding. The effects of such changes in survival or recovery rates on estimates of these rates are examined in Appendix C. A summary of results obtained under Model 1 of Brownie et al. (1978) is presented here.

If recovery rates increase as a function of years after banding, then recovery rates will be underestimated and survival rates will be overestimated. Alternatively, if recovery rates decrease, then recovery rates will be overestimated and survival rates underestimated. The effects of changes in survival rates are opposite those of changes in recovery rates. Recovery rates will be underestimated and survival rates overestimated (for most years) if survival rates increase as a function of years after banding; decreasing survival rates cause overestimates of recovery rate and underestimates of survival rate.

The magnitude of bias in survival or recovery rate estimates is affected by the extent to which the true rates vary with years after banding. Fortunately, power of the goodness-of-fit test to reject the model increases with larger changes in survival rates. However, the test has very little power to detect such changes in recovery rates.

We conclude that the data would usually be rejected by the goodness-of-fit test if mallard survival rates actually changed as a function of years after banding. Although the

Table 11. The effects of recovery type, age at banding, and sex on recovery dates of mallards.[a]

Source	df	Sum of squares	F value	p>F	Estimate (Days)
Model	7	5467831.4	775.19	0.0001	
Recovery type (R)	(1)	1542208.1	1530.49	0.0001	−9.3
Age at banding	(1)	893996.1	887.21	0.0001	7.0
Sex	(1)	767261.4	761.43	0.0001	−6.5
R * Age interaction	(1)	362450.1	359.70	0.0001	9.0
R * Sex interaction	(1)	78990.1	78.39	0.0001	4.2
Age * Sex interaction	(1)	61467.7	61.00	0.0001	3.7
R * Age * Sex interaction	(1)	42889.3	42.56	0.0001	−6.2
Error	82364	82994355.6			
Corrected total	82371	88462187.0			

[a]Day 1 = 1 September. Inexact recovery dates were excluded. All major reference and harvest areas and 1961–75 hunting seasons were combined.

Table 12. Summary of results of testing the effects of recovery type (R), age at banding (A), and sex (S) on dates of indirect recoveries of mallards from major reference areas.[a]

Major reference area	Parameters, estimates (days), and significance tests													
	Rec. type		Age		Sex		R * A		R * S		A * S		R*A*S	
(number of recoveries)	est.	p>t	est.	p>t	est.	p>t	est.	p>t	est.	p>t	est.	p>t	est.	p>t
N Pacific (70)		ns		ns		ns		ns		ns		ns		ns
N Alta - N Nwt (978)		ns	-4.7	*		ns	14.2	**		ns		ns		ns
SW Alberta (1098)		ns	-6.7	**	-8.6	**		ns		ns		ns		ns
SW Saskatchewan (3053)		ns		ns	-4.5	**		ns		ns		ns		ns
SE Saskatchewan (808)		ns		ns		ns		ns		ns		ns		ns
SW Manitoba (1864)	-5.5	**		ns	-4.2	*		ns		ns		ns		ns
N Sask-N Man-W Ont (354)		ns		ns		ns		ns		ns		ns		ns
E Ont - W Que (3662)	-4.5	**	2.9	*	-8.2	**		ns		ns		ns		ns
Washington - Oregon (2243)		ns		ns	-4.4	**	7.3	**		ns		ns		ns
N California (1420)	-5.2	**	5.2	**		ns		ns		ns		ns		ns
Intermountain (2096)	-4.1	**		ns	-5.1	**		ns		ns		ns		ns
High Plains (3547)	-7.0	**	2.7	*	-9.3	**		ns		ns		ns		ns
Missouri R. Basin (5859)		ns	2.6	**	-9.9	**		ns	4.8	**		ns		ns
Great Lakes (6772)	-4.2	**	1.6	*	-10.9	**		ns		ns		ns		ns
Mid-Atlantic (2123)	-3.9	**	3.9	**	-5.6	**		ns	5.8	*		ns		ns
NE United States (1379)		ns		ns	-6.0	**		ns		ns		ns		ns

[a]Two levels of each main effect were compared; recovery type (HSS2 - HSS3-N), age at banding (adult - immature), and sex (female - male). HSS2 represents birds harvested during the second hunting season after banding; HSS3-N represents birds harvested during the third through Nth hunting season after banding. Parameter estimates (est.) are shown only for effects that were significant (* p>t = 0.05; ** p>t = 0.01). Lack of significance is indicated by "ns". The interaction between the effects of recovery type (R) and age (A), for example, is shown as "R * A".

Table 13. The effects of recovery type, age at banding, and sex on dates of indirect recoveries of mallards.[a]

Source	df	Sum of squares	F value	p>F	Estimate (Days)
Model	7	821955.6	110.99	0.0001	
Recovery type (R)	(1)	88086.9	83.26	0.0001	-3.3
Age at banding	(1)	52213.1	49.35	0.0001	2.5
Sex	(1)	579362.9	547.63	0.0001	-8.4
R * Age interaction	(1)	12356.0	12.53	0.0004	2.5
R * Sex interaction	(1)	44.9	0.04	0.8368	-0.2
Age * Sex interaction	(1)	1439.0	1.36	0.2435	-0.8
R * Age * Sex interaction	(1)	35.9	0.03	0.8538	-0.3
Error	37226	39383210.5			
Corrected total	37233	40205166.1			

[a]Day 1 = 1 September. Inexact recovery dates were excluded. Indirect recoveries were split into HSS-2 and HSS3-N categories. All major reference and harvest areas and 1961-75 hunting seasons were combined.

model was insensitive to similar changes in recovery rates, we do not expect these changes to be large enough to appreciably bias survival rate estimates. We further conclude that results generally parallel those of our geographic distribution comparisons, although differences in mean recovery dates were small. For instance, we previously concluded that direct immature male and female recovery distributions were sufficiently similar geographically to allow their combination; their mean recovery dates differed temporally by about 1 day. Our data suggest that differences in dates of recovery are age- and sex-dependent beyond the first year of life, and to some extent provide evidence for a "subadult" age class. Anderson (1975:18) concluded there was insufficient evidence that mallard subadult survival or recovery rates were different from adult survival, although his test results were not conclusive. Hopper et al. (1978) found no differences in survival or recovery rates between subadult and adult mallards banded during the winter, although they found substantial distributional differences in recovery patterns. We suggest that these age- and sex-specific differences in timing of recovery (harvest) may be related to differential vulnerability, but differential availability (timing and rate of movement through harvest areas) cannot be discounted.

Table 14. Mean dates of mallard recoveries by age, sex, and three categories of time between banding and recovery (all major reference and harvest areas, and 1961-75 hunting seasons combined).[a]

	Male				Female			
Time[b]	Immature		Adult		Immature		Adult	
HSS-1	62.78		77.70		61.73		69.87	
		>**[c]		>**		>**		>*
HSS-2	77.59		81.86		69.61		72.91	
		>**		>NS		>**		>NS
HSS3-N	82.12		83.72		74.16		75.05	

[a]Day 1 = 1 September; Day 80, for example, = 19 November. Inexact recovery dates were excluded.

[b]HSS-1 represents birds harvested during the first hunting season after banding; HSS-2 represents birds harvested during the second hunting season after banding; HSS3-N represents birds harvested during the third through Nth hunting season after banding.

[c]Scheffe's method of multiple comparisons (Kleinbaum and Kupper 1978:271-276) was used to test for differences between means. Significance levels: * $p<0.05$ and ** $p<0.01$.

Distribution of Mallard Harvest from Breeding Reference Areas

Harvest distribution was based on recoveries that were each adjusted for band reporting rate. Indirect recoveries were adjusted with the estimated reporting rate for the recovery year. Population weighting was not necessary because each reference area was addressed separately.

Table 15 shows percent distribution of the harvest of adult males from major breeding ground reference areas to harvest areas as previously defined. Tables 16, 17, and 18 show the same information for adult female, immature, and total mallards. Two maps were prepared for each major reference area to facilitate presentation of these data: (1) a map showing harvest distribution by age-sex class among Alaska-Canada, the flyways, and High (west) and Low (east) Plains portions of the Central Flyway (separated by the 100th meridian); and (2) an adjoining map showing distribution of the total mallard harvest among harvest areas, based on direct and indirect recoveries of all age-sex classes, except locals. A brief description of harvest distribution from each major reference area is presented here.

N Pacific. — Distribution of the harvest from this area was based on a small sample of 226 recoveries (Table 18). The harvest occurred mainly in Alaska-Canada and the Pacific Flyway (Fig. 2). British Columbia, Washington, and Oregon accounted for 84.3% of the total mallard harvest (Fig. 3).

N Alberta-N Northwest Territories. — Harvest from this area was well distributed among Canada and the flyways (Fig. 4), except for the Atlantic Flyway. Immatures (49%) predominated in Canada. Based on total mallards (Fig. 5), Alberta (18.9%) and Washington (10.7%) were major harvest areas. Some of these birds move across the northern portion of the High Plains, the Low Plains, and into western Mississippi Flyway States such as Arkansas (7.3%) and Louisiana (5.8%).

SW Alberta. — The Pacific Flyway (33%), Canada (31%), and the Central Flyway (25%, including 16% in the High Plains) received the major portion of the total mallard harvest from this area; the harvest of immatures (59%) and adult females (38%) occurred mainly in Canada, whereas that of adult males (40%) occurred mainly in the Pacific Flyway (Fig. 6). Major harvest areas (Fig. 7) were Alberta (28.6%), Idaho (11.5%), and Washington (11.3%).

SW Saskatchewan. — The Mississippi Flyway (42%) was the major recipient of the total mallard harvest from this area (Fig. 8); most of the remaining harvest was equally divided between Canada and the Central Flyway (both 26%). A higher proportion of total mallards from this area was harvested in the Low Plains (18%) than in the High Plains (8%). The immature harvest (46%) occurred mainly in Canada, whereas 42-44% of the adult harvest occurred in the Mississippi Flyway. Major harvest areas (Fig. 9) were Saskatchewan (19.8%), Arkansas (13.1%), and Louisiana (9.0%).

SE Saskatchewan. — Except for the increased importance of the Mississippi Flyway, and the decreased importance of the High Plains, distribution of harvest from this area (Fig. 10) was similar to that from *SW Saskatchewan* (Fig. 8). Immatures (47%) were harvested mainly in Canada, whereas adults (males, 58%; females, 51%) were harvested mainly in the Mississippi Flyway. Most birds from this area move south into the Low Plains and then southeast into the Mississippi Flyway. Major harvest areas (Fig. 11) also included Saskatchewan (22.7%), Arkansas (14.5%), and Louisiana (10.4%).

SW Manitoba. — The Mississippi Flyway (47%) and Canada (39%) accounted for most of the total mallard harvest from this area (Fig. 12). Among the four southern Canadian reference areas from Alberta to Manitoba, this area contributed the greatest percentage of its total mallard harvest to Canada. The two reference areas in southern Saskatchewan and the *SW Manitoba* area showed similar patterns of harvest distribution, such as (1) the Mississippi Flyway as the major recipient of adult and total mallard harvests, (2) Canada as the major recipient of the immature harvest, (3) a higher percentage of adult females than adult males harvested in Canada, and (4) Arkansas as the major harvest area in the United States (Fig. 13). About 10% of the total mallard harvest from this area occurred in the Low Plains.

N Saskatchewan-N Manitoba-W Ontario. — Although a reasonable number of recoveries was available (1,002 for total mallards), the banding distribution was probably too heavily concentrated along the southern margin to be representative of the entire area. The Mississippi Flyway dominated in the harvest represented by these bandings with 54% of the adult males, 69% of the adult females, 57% of the immatures, and 61% of the total mallard harvest (Fig. 14). This was the only Canadian reference area from which more immatures were harvested in the United States than in Canada. Major mallard harvest areas (Fig. 15) were Manitoba (12.1%), Minnesota (11.4%), and Ontario (8.8%).

E Ontario-W Quebec. — This was the only Canadian reference area for which the total harvest in Canada (61%) exceeded that in the United States (Fig. 16), and for which most of the harvest in the United States occurred in the Atlantic Flyway (23%). Ontario accounted for 51.8% of the total mallard harvest from this area (Fig. 17).

Washington-Oregon. — For total mallards, 95% of the harvest from this area remained within the Pacific Flyway (Fig. 18) and 80.6% remained within the reference area (Fig. 19). Other than Washington and Oregon, California (11.2%) and British Columbia (3.6%) were the major harvest recipients.

N California. — Ninety-nine percent of the harvest from this area remained within the Pacific Flyway (Fig. 20) and 90.7% within California (Fig. 21).

Intermountain. — Most of this reference area is in the Pacific Flyway, and 83% of the total mallard harvest remained in the Flyway (Fig. 22). A large percentage (71.4%) of the total harvest of these birds occurred within the reference area (Fig. 23). The higher incidence of adult females (15%) than adult males (4%) in the Central Flyway from this area probably is not meaningful. This difference apparently resulted from the banding of relatively large numbers of immatures and few adults near the eastern boundary of the area, and our inclusion of direct recoveries of adult females with indirect recoveries of immature females. About 1% of these birds were harvested in the Low Plains.

High Plains. — This area is almost entirely within the Central Flyway (Fig. 24). Eighty-six percent of the total mallard harvest remained within the Flyway. However, the high percentage (79%) of harvest in the High Plains portion of the Central Flyway and the 64% harvested in Eastern Colorado (Fig. 25) are biased upward by unrepresentatively large numbers of birds banded in the San Luis Valley at the southern extreme of the reference area. About 25% of the recoveries from mallards banded preseason in Eastern Montana (northern extreme of the area) were reported from the Mississippi Flyway (Anderson and Henny 1972).

Missouri River Basin. — The Mississippi Flyway dominated in the harvest from this area (Fig. 26), although the major portion of this area is in the Central Flyway. Large banded samples in the northeastern portion (western Minnesota) of the reference area overemphasized importance of the Mississippi Flyway in the harvest (67%) of birds from this area. Minnesota, with 23.3% of the total mallard harvest (Fig. 27), dominated as a harvest area, with Arkansas (10.8%) second. About 5% of the mallard harvest from this area extended to the High Plains, whereas 17% remained within the Low Plains.

Great Lakes. — Eighty-three percent of the total mallard harvest from this area, located entirely within the Mississippi Flyway, remained within the Flyway (Fig. 28). The Atlantic Flyway was second in importance with 8% of the total mallard harvest and 15% of the adult males. Wisconsin was the major harvest area (34.8%, Fig. 29).

Mid-Atlantic. — All of this area, except for Ohio, is in the Atlantic Flyway (Fig. 30). Seventy-three percent of the combined harvest occurred in the Atlantic Flyway, 18% in the Mississippi Flyway, and 8% in Canada. As noted earlier with respect to the *Intermountain* area, the inclusion of indirect immature female recoveries to represent the harvest of adult females probably exaggerated the distribution. The most prominent harvest areas (Fig. 31) were New York (34.9%), Pennsylvania (13.4%), and Ohio (7.2%).

NE United States. — Most of the harvest from this area is distributed in the Atlantic Flyway (Fig. 32). The relative dispersion of adult females to adult males is also probably exaggerated. The most prominent harvest areas (Fig. 33) were New York (30.5%), New England (19.3%), and Ontario (15.9%). However, both here and in the *Mid-Atlantic* the importance of New York is exaggerated by the relatively high intensity of banding there.

Comparison of Harvest Distribution from Banding Data and Harvest Survey Data

Percent distribution of the total mallard harvest in the United States, based on banding and recovery data used in this report (1961–75), is compared in Table 19 with the distribution indicated by harvest surveys (1966–75) as summarized by Carney et al. (1978). Both are estimates and it would be inappropriate to view one as a "check" on the other. However, we have greater confidence when these independently obtained estimates agree with each other.

Banding and harvest data agreed most closely in the Mississippi Flyway; both data sources indicated that Arkansas was the area of greatest mallard harvest in the United States (Table 19). Harvest in the combined Pacific and Central flyways was 48.8% as indicated by banding data and 49.2% by harvest surveys. Banding data suggested that the larger portion of harvest occurred in the Central Flyway, but harvest data suggested that the Pacific Flyway harvested the larger portion. Geis (1971) demonstrated a similar pattern of disagreement using a more restricted banding and harvest data set (1966–68) and State- and Province-defined population weights. We suspect the discrepancy in California is due to a lack of banded birds in important source areas. Birds banded in Colorado's San Luis Valley were assigned population weights for the *High Plains*, which resulted in a overweighting of these birds and an overestimate of the harvest. San Luis Valley mallard recoveries also were reported at unusually high rates associated with experimental seasons (Hopper et al. 1975).

Derivation of Mallard Harvest from Breeding Reference Areas

Harvest derivation (Tables 20–23) was based on recoveries that were each adjusted for band reporting rate and then population-weighted (see Methods). Reporting rate adjustments were based on the recovery year, whereas population weights reflected the band year. Estimates of harvest derivation rely on accurate preseason population estimates, and adequate and representative banding of all population segments; for these and other reasons caution must be exercised in their interpretation. For example, banding effort was low in Eastern Wyoming compared to other Central Flyway States. This perhaps led to an underestimation of the importance of locally derived birds and a consequent overestimation of the importance of birds from other areas.

We have simplified and summarized information contained in Tables 20–23 by presenting two maps (Appendix D) for harvest areas that accounted for 0.5% or

Table 15. Percent distribution of the adult male mallard harvest from major reference areas to harvest areas within the United States and Canada (1961-75 hunting seasons combined).[a]

Harvest area of recovery	Major reference area of banding															
	N PAC 1	N ALTA N NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16
AK	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
YUK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BC	50.2	1.5	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NWTM	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ALTA	0.0	14.6	21.1	4.0	0.0	0.0	1.3	0.0	0.2	0.0	0.4	0.0	0.0	0.0	0.0	0.0
SASK	0.0	5.8	0.4	18.1	18.3	2.6	4.4	0.0	0.0	0.0	0.0	0.8	0.2	0.0	0.0	0.0
MAN	0.0	0.9	0.0	0.4	1.0	27.9	18.2	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0	0.0
ONT	0.0	0.0	0.0	0.0	0.3	1.0	5.6	48.2	0.0	0.0	0.0	0.0	1.8	4.5	2.2	10.8
QUE	0.0	0.0	0.4	0.0	0.0	0.0	0.0	11.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1
N B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PEI	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
N S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WA	23.8	6.0	12.3	1.4	0.3	0.0	0.0	0.0	44.8	0.1	1.9	0.1	0.0	0.0	0.0	0.0
OR	8.3	3.4	4.3	1.1	0.0	0.0	0.0	0.0	32.9	5.5	2.8	0.0	0.0	0.0	0.0	0.0
ID	3.0	4.2	15.0	1.5	0.0	0.1	1.3	0.0	2.0	0.0	43.1	0.5	0.1	0.0	0.0	0.0
MT-W	0.0	1.5	4.9	1.0	0.0	0.0	0.0	0.0	0.2	0.0	27.0	0.5	0.1	0.0	0.0	0.0
WY-W	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0
CA	0.0	1.5	1.8	0.2	0.4	0.1	0.0	0.0	16.6	94.4	2.3	0.0	0.0	0.0	0.0	0.0
NV	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.3	0.0	4.6	0.1	0.0	0.0	0.0	0.0
UTAH	0.0	0.6	1.2	0.1	0.0	0.0	0.0	0.0	0.2	0.0	11.6	0.3	0.0	0.0	0.0	0.0
CO-W	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.6	3.0	0.0	0.0	0.0	0.0
AZ	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.4	0.2	0.0	0.0	0.0	0.0
NM-W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.6	0.0	0.0	0.0	0.0
MT-E	0.0	1.3	1.3	1.0	0.3	0.0	0.0	0.0	0.0	0.0	0.2	5.3	0.1	0.0	0.0	0.0
ND-W	0.0	1.0	0.0	0.6	0.6	1.0	0.0	0.0	0.0	0.0	0.0	0.4	6.5	0.1	0.0	0.0
ND-E	0.0	1.6	0.3	0.8	1.1	2.2	1.5	0.0	0.0	0.0	0.0	0.3	7.1	0.4	0.0	0.0
SD-W	0.0	0.6	0.0	0.8	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.7	0.3	0.0	0.0	0.0
SD-E	0.0	2.9	1.2	2.2	2.9	1.7	2.3	0.0	0.0	0.0	0.0	1.1	5.6	0.0	0.0	0.0
WY-E	0.0	0.0	2.1	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.3	1.6	0.0	0.0	0.0	0.0
NEB-W	0.0	3.7	5.6	2.3	0.1	0.1	0.0	0.0	0.0	0.0	0.6	3.7	0.6	0.0	0.0	0.0
NEB-E	0.0	3.1	2.9	3.2	4.3	1.1	3.2	0.0	0.0	0.0	0.1	1.8	2.2	0.0	0.0	0.0
CO-E	0.0	1.4	5.6	2.8	0.7	0.2	0.0	0.0	0.0	0.0	1.6	62.4	0.3	0.0	0.0	0.0
KS-W	0.0	0.8	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0
KS-E	0.0	4.0	3.0	4.1	3.2	1.5	0.0	0.0	0.0	0.0	0.0	1.6	1.5	0.0	0.0	0.0
NM-E	0.0	0.0	1.5	0.1	0.0	0.0	0.8	0.0	0.0	0.0	0.2	4.1	0.1	0.0	0.0	0.0
OK-W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
OK-E	0.0	2.3	1.6	3.0	3.0	0.9	0.0	0.0	0.0	0.0	0.2	0.8	1.6	0.1	0.0	0.0
TX-W	0.0	0.4	0.9	0.5	0.0	0.2	0.0	0.0	0.0	0.0	0.3	1.6	0.2	0.0	0.0	0.0
TX-E	0.0	5.8	2.2	4.9	2.6	1.6	0.0	0.0	0.0	0.0	0.2	1.7	2.3	0.1	0.0	0.0
MN	0.0	2.1	0.0	1.6	3.3	4.0	6.9	0.0	0.0	0.0	0.2	0.1	13.3	4.0	0.2	0.0
WISC	0.0	0.4	0.0	0.6	0.6	3.3	7.5	0.1	0.0	0.0	0.0	0.0	4.1	31.0	0.2	0.0
MICH	0.0	0.9	0.0	0.3	0.6	0.8	7.2	2.5	0.0	0.0	0.0	0.0	1.8	14.5	0.7	0.4

Table 15. Continued.

Harvest area of recovery	Major reference area of banding															
	N PAC 1	N ALTA N NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16
IOWA	0.0	2.3	0.0	2.9	5.1	4.8	4.9	0.1	0.0	0.0	0.0	0.6	5.3	1.9	0.0	0.0
ILL	5.9	5.0	0.6	4.2	6.6	8.7	11.0	0.1	0.0	0.0	0.0	0.4	7.4	6.8	0.4	0.0
IND	0.0	0.2	0.0	0.1	0.4	0.7	1.7	0.3	0.0	0.0	0.0	0.0	1.3	2.4	0.2	0.0
OHIO	0.0	0.0	0.0	0.0	0.6	0.8	0.0	1.7	0.0	0.0	0.0	0.0	0.7	5.2	7.8	0.2
MO	3.0	4.1	1.2	5.6	3.8	4.5	4.7	0.0	0.0	0.0	0.0	0.7	4.0	0.8	0.0	0.0
KY	0.0	0.0	0.3	0.6	0.3	1.2	0.0	0.6	0.0	0.0	0.0	0.2	0.9	1.6	1.1	0.0
ARK	0.0	8.5	5.1	13.0	18.2	9.6	6.4	0.2	0.0	0.0	0.6	1.7	11.1	3.1	0.7	0.0
TENN	0.0	0.9	0.0	2.5	1.7	4.3	1.6	1.5	0.0	0.0	0.0	0.3	2.4	4.7	2.7	0.5
LA	0.0	3.8	2.2	9.0	10.0	5.7	0.0	0.0	0.0	0.0	0.0	2.0	5.6	1.0	0.0	0.0
MISS	0.0	1.6	0.0	3.3	6.4	5.3	1.7	0.7	0.0	0.0	0.2	0.4	3.6	1.7	0.3	0.2
ALAB	0.0	0.4	0.0	0.3	0.3	0.6	0.0	1.0	0.0	0.0	0.0	0.1	0.8	1.1	0.6	0.0
ME	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2
VT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.6
N H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
MASS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.1	0.0	0.2	12.3
CT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.2	0.0	2.1
R I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0
N Y	0.0	0.0	0.0	0.0	0.1	0.4	1.9	6.9	0.0	0.0	0.0	0.0	0.3	1.6	23.6	27.7
PA	0.0	0.0	0.0	0.1	0.0	0.4	2.6	5.0	0.0	0.0	0.0	0.0	0.4	2.0	28.8	6.4
W V	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.5
N J	0.0	0.0	0.0	0.0	0.0	0.4	0.0	2.9	0.0	0.0	0.0	0.0	0.2	0.5	4.4	10.3
DEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	0.2	0.3	3.9	3.6
MD	0.0	0.0	0.0	0.1	1.1	0.3	0.0	2.6	0.0	0.0	0.0	0.0	0.4	1.5	7.4	7.3
VA	0.0	0.0	0.0	0.1	0.3	0.4	1.9	3.7	0.0	0.0	0.0	0.0	0.7	2.3	6.0	2.9
N C	0.0	0.0	0.0	0.1	0.0	0.4	0.0	2.4	0.0	0.0	0.0	0.0	0.4	1.5	1.9	1.5
S C	0.0	0.0	0.0	0.2	0.7	0.6	0.0	2.4	0.0	0.0	0.0	0.1	1.6	3.6	5.0	1.1
GA	0.0	0.5	0.0	0.1	0.5	0.2	0.0	0.6	0.0	0.0	0.0	0.0	0.3	1.2	0.5	0.4
FL	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.4
Ak-Canada	56.1	23.2	21.9	22.6	19.7	31.5	29.5	59.7	2.7	0.0	0.4	0.9	4.4	4.5	2.2	13.9
Pacific	35.0	17.2	40.3	5.6	0.7	0.2	2.8	0.0	97.3	100.0	95.0	5.2	0.2	0.0	0.0	0.0
Central	0.0	29.0	28.3	27.0	19.0	10.7	7.7	0.0	0.0	0.0	3.7	87.5	28.5	0.9	0.0	0.0
High	(0.0)	(9.3)	(17.1)	(8.8)	(1.9)	(1.7)	(0.7)	(0.0)	(0.0)	(0.0)	(3.2)	(80.2)	(8.2)	(0.3)	(0.0)	(0.0)
Low	(0.0)	(19.7)	(11.2)	(18.2)	(17.1)	(9.0)	(7.0)	(0.0)	(0.0)	(0.0)	(0.5)	(7.3)	(20.3)	(0.6)	(0.0)	(0.0)
Miss.	8.9	30.1	9.3	44.1	57.8	54.4	53.6	8.9	0.0	0.0	0.9	6.4	62.4	79.6	14.9	1.3
Atlantic	0.0	0.5	0.1	0.8	2.8	3.2	6.4	31.4	0.0	0.0	0.0	0.1	4.5	15.0	82.9	84.8
Total pct	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N actual	22	275	386	1081	336	839	62	804	551	664	680	1209	1796	1010	435	237
N adj.	34	487	673	2066	667	1772	126	2025	959	1168	1231	2220	3531	2186	921	566

[a]Harvest distribution was based on direct adult male recoveries (N actual) that were each adjusted for band reporting rate (N adj.).

Table 16. Percent distribution of the adult female mallard harvest from major reference areas to harvest areas within the United States and Canada (1961-75 hunting seasons combined).[a]

Harvest area of recovery	Major reference area of banding															
	N PAC 1	N ALTA N NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16
AK	1.7	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0
YUK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BC	39.6	1.1	0.9	0.2	0.0	0.0	0.0	0.0	3.9	0.1	0.3	0.1	0.0	0.0	0.0	0.0
NWTM	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ALTA	0.0	18.2	36.5	5.5	0.2	0.3	0.3	0.0	0.9	0.1	2.0	1.1	0.3	0.0	0.0	0.0
SASK	0.0	5.3	0.3	21.4	24.8	1.7	3.8	0.1	0.1	0.0	0.4	1.2	1.3	0.2	0.1	0.1
MAN	0.0	1.4	0.4	0.8	2.7	38.5	7.7	0.2	0.1	0.0	0.0	0.6	4.0	0.8	0.3	0.0
ONT	0.0	0.1	0.0	0.1	0.8	0.5	8.0	48.5	0.0	0.2	0.0	0.0	1.5	5.0	7.9	17.7
QUE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.0	0.0	0.1	0.7	6.5
N B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PEI	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
N S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
WA	32.3	16.5	12.1	1.9	0.0	0.0	0.0	0.0	46.7	1.1	2.7	0.1	0.1	0.0	0.0	0.0
OR	16.0	3.1	4.4	0.5	0.0	0.0	0.0	0.0	31.2	6.5	3.2	0.1	0.0	0.0	0.0	0.0
ID	4.4	3.9	12.2	1.8	0.2	0.0	0.0	0.0	2.1	0.2	39.4	0.8	0.1	0.0	0.1	0.0
MT-W	0.0	0.1	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	7.2	0.0	0.0	0.0	0.0	0.0
WY-W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
CA	2.9	1.9	3.0	0.7	0.0	0.1	0.0	0.0	13.6	91.0	5.5	0.2	0.0	0.0	0.0	0.0
NV	0.0	0.2	0.4	0.3	0.0	0.0	0.0	0.0	0.8	0.5	10.6	0.0	0.0	0.0	0.0	0.0
UTAH	0.0	0.9	2.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	10.9	0.5	0.0	0.0	0.0	0.0
CO-W	0.0	0.0	0.0	0.1	0.4	0.0	0.0	0.0	0.0	0.0	0.4	1.1	0.0	0.0	0.0	0.0
AZ	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.4	0.0	0.0	0.0	0.0
NM-W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.0	0.0	0.0	0.0
MT-E	0.0	0.2	0.5	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.3	2.2	0.0	0.0	0.0	0.0
ND-W	0.0	1.5	0.0	1.4	0.5	0.6	0.6	0.1	0.0	0.0	0.0	0.5	4.5	0.1	0.0	0.0
ND-E	0.0	0.7	0.0	1.7	2.8	3.4	0.0	0.2	0.0	0.0	0.0	0.5	5.3	0.9	0.2	0.1
SD-W	0.0	0.0	0.3	0.2	1.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.0	0.0	0.0
SD-E	0.0	1.1	0.5	1.8	1.3	1.1	1.3	0.1	0.0	0.0	0.1	0.7	7.2	0.5	0.1	0.1
WY-E	0.0	0.8	4.3	0.5	0.5	0.0	0.0	0.0	0.2	0.0	12.1	1.5	0.1	0.0	0.1	0.0
NEB-W	0.0	1.5	2.7	1.3	0.4	0.1	0.0	0.0	0.0	0.0	0.4	2.7	0.3	0.0	0.0	0.0
NEB-E	0.0	2.2	0.7	1.9	2.9	1.1	1.3	0.0	0.0	0.0	0.0	1.0	1.5	0.1	0.0	0.0
CO-E	0.0	1.9	1.4	1.6	0.2	0.1	0.0	0.0	0.0	0.0	0.5	67.9	0.2	0.0	0.0	0.0
KS-W	0.0	0.2	0.3	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.0	0.0
KS-E	0.0	2.4	2.2	2.9	3.8	1.2	2.1	0.0	0.0	0.0	0.1	0.7	1.0	0.0	0.0	0.0
NM-E	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	4.3	0.0	0.0	0.0	0.0
OK-W	0.0	0.1	1.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.6	2.2	0.0	0.0	0.0	0.0
OK-E	0.0	1.6	2.2	3.8	3.2	1.2	0.0	0.0	0.0	0.0	0.1	0.4	1.4	0.0	0.0	0.1
TX-W	0.0	0.2	0.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.2	0.1	0.0	0.0	0.0
TX-E	0.0	3.2	2.2	5.4	3.6	1.1	1.9	0.0	0.0	0.0	0.3	1.5	2.4	0.2	0.0	0.0
MN	0.0	1.0	0.3	2.5	5.4	6.3	15.6	0.6	0.0	0.0	0.0	0.3	23.5	9.3	1.6	0.5
WISC	0.0	0.3	0.0	0.7	2.1	2.9	4.2	1.6	0.0	0.0	0.0	0.1	4.7	34.6	1.9	0.6
MICH	0.0	0.0	0.0	0.1	0.3	0.5	2.4	3.8	0.0	0.0	0.0	0.0	0.8	14.2	2.5	0.9

Table 16. Continued.

Harvest area of recovery	Major reference area of banding: N PAC 1	N N ALTA NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16
IOWA	1.0	2.7	0.3	3.2	4.1	2.6	5.5	0.1	0.0	0.0	0.1	0.3	4.8	1.6	0.1	0.1
ILL	0.0	1.3	0.3	2.8	3.3	5.4	9.8	0.3	0.0	0.0	0.1	0.0	6.0	6.3	0.5	0.3
IND	0.0	0.0	0.3	0.1	0.8	0.4	1.2	0.5	0.0	0.0	0.0	0.1	0.5	1.7	0.4	0.3
OHIO	0.0	0.0	0.0	0.2	0.0	0.1	1.2	1.7	0.0	0.0	0.0	0.0	0.1	3.2	6.6	0.4
MO	0.0	5.1	2.6	3.6	4.6	4.5	5.9	0.2	0.0	0.0	0.1	0.6	3.9	0.8	0.2	0.0
KY	0.0	0.4	0.0	0.5	0.3	0.6	1.9	0.7	0.0	0.0	0.0	0.0	0.5	1.0	0.7	0.0
ARK	2.0	7.5	2.4	12.6	11.2	10.9	6.9	0.8	0.0	0.1	0.0	1.4	10.0	2.7	0.3	0.1
TENN	0.0	0.9	0.3	1.5	2.5	2.2	4.2	2.4	0.0	0.0	0.0	0.1	1.9	3.1	2.2	0.5
LA	0.0	7.7	1.4	11.0	12.3	6.6	5.7	0.4	0.0	0.1	0.0	2.0	6.7	2.0	0.4	0.1
MISS	0.0	1.2	0.3	2.8	2.9	3.7	3.9	1.0	0.0	0.0	0.0	0.2	2.6	2.1	0.3	0.2
ALAB	0.0	0.5	0.2	0.2	0.7	0.9	0.7	1.3	0.0	0.0	0.0	0.0	0.5	1.2	0.7	0.2
ME	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
VT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.5
N H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
MASS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	7.5
CT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.1	0.0	0.1	1.4
R I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
N Y	0.0	0.0	0.0	0.1	0.0	0.0	0.0	6.1	0.0	0.0	0.0	0.0	0.1	0.5	26.3	26.7
PA	0.0	0.0	0.0	0.1	0.0	0.0	0.7	3.7	0.0	0.0	0.0	0.0	0.1	0.7	18.0	3.3
W V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0
N J	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.1	0.1	4.0	6.4
DEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.2	3.3	4.1
MD	0.0	0.0	0.0	0.0	0.0	0.1	0.3	2.2	0.0	0.0	0.0	0.0	0.1	0.5	5.7	4.2
VA	0.0	0.3	0.0	0.1	0.0	0.3	0.0	3.8	0.1	0.0	0.0	0.0	0.2	0.9	5.2	4.3
N C	0.0	0.0	0.0	0.0	0.0	0.0	0.7	2.5	0.0	0.0	0.0	0.1	0.1	1.0	3.3	2.3
S C	0.0	0.0	0.0	0.3	0.0	0.3	0.0	3.3	0.0	0.0	0.0	0.0	0.5	3.1	5.4	2.0
GA	0.0	0.0	0.0	0.1	0.0	0.3	2.2	0.8	0.0	0.0	0.0	0.0	0.2	0.7	0.6	0.6
FL	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.3
Ak-Canada	41.3	26.8	38.0	28.0	28.4	41.1	19.8	55.9	5.2	0.3	2.6	3.1	7.2	6.2	9.0	24.5
Pacific	55.7	26.6	34.5	5.8	0.5	0.1	0.0	0.0	94.4	99.4	82.1	3.9	0.2	0.0	0.1	0.0
Central	0.0	17.8	19.0	23.8	20.3	10.2	7.1	0.5	0.2	0.0	15.0	88.0	24.3	1.8	0.4	0.3
High	(0.0)	(6.6)	(11.2)	(6.3)	(2.7)	(1.1)	(0.5)	(0.2)	(0.2)	(0.0)	(14.4)	(83.2)	(5.5)	(0.1)	(0.1)	(0.0)
Low	(0.0)	(11.2)	(7.8)	(17.5)	(17.6)	(9.1)	(6.6)	(0.3)	(0.0)	(0.0)	(0.6)	(4.8)	(18.8)	(1.7)	(0.3)	(0.3)
Miss.	3.1	28.5	8.4	41.6	50.8	47.7	69.1	15.4	0.1	0.3	0.3	5.0	66.7	83.9	18.4	4.0
Atlantic	0.0	0.3	0.0	0.8	0.0	1.0	4.0	28.3	0.1	0.0	0.0	0.1	1.6	8.1	72.2	71.2
Total pct	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N actual	59	458	361	964	297	834	160	2505	1604	819	1138	1668	3418	5739	1557	1045
N adj.	96	844	652	1868	594	1820	329	5930	2890	1530	1968	3228	6885	12326	3410	2405

[a]Harvest distribution was based on direct and indirect adult, and indirect immature female recoveries (N actual) that were each adjusted for band reporting rate (N adj.).

Table 17. Percent distribution of the immature mallard harvest from major reference areas to harvest areas within the United States and Canada (1961-75 hunting seasons combined).[a]

Harvest area of recovery	N PAC 1	N ALTA N NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16
AK	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
YUK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BC	61.0	1.8	0.4	0.1	0.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NWTM	0.0	6.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ALTA	1.0	34.6	58.6	11.3	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
SASK	0.0	5.5	0.2	34.0	46.1	2.3	5.4	0.0	0.0	0.0	0.0	0.5	0.1	0.0	0.0	0.0
MAN	0.0	0.3	0.0	0.3	0.4	56.8	17.0	0.0	0.0	0.0	0.0	0.1	7.3	0.0	0.0	0.0
ONT	0.0	0.0	0.0	0.2	0.3	0.2	11.6	64.7	0.0	0.0	0.0	0.0	0.7	4.3	6.7	17.4
QUE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4
N B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PEI	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
N S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WA	22.1	9.4	7.3	1.2	0.0	0.0	0.0	0.0	45.9	0.2	1.6	0.0	0.0	0.0	0.0	0.0
OR	6.2	4.1	3.1	0.2	0.0	0.0	0.0	0.0	43.7	7.2	2.7	0.0	0.0	0.0	0.0	0.0
ID	2.9	2.4	6.6	1.6	0.0	0.1	0.1	0.0	1.1	0.0	28.5	0.2	0.0	0.0	0.0	0.0
MT-W	0.0	1.4	4.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	30.2	0.1	0.0	0.0	0.0	0.0
WY-W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CA	5.6	1.7	3.4	0.5	0.0	0.0	0.0	0.0	5.1	92.5	3.4	0.0	0.0	0.0	0.0	0.0
NV	0.0	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.2	0.0	11.6	0.0	0.0	0.0	0.0	0.0
UTAH	0.0	0.4	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	18.9	0.3	0.0	0.0	0.0	0.0
CO-W	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.8	0.0	0.0	0.0	0.0
AZ	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.5	0.0	0.0	0.0	0.0
NM-W	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
MT-E	0.0	0.4	1.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.1	0.1	0.0	0.0	0.0
ND-W	0.0	1.5	0.2	0.6	1.1	1.2	0.6	0.0	0.0	0.0	0.0	0.4	2.4	0.0	0.0	0.0
ND-E	0.0	1.6	0.0	0.9	2.2	2.1	1.0	0.0	0.0	0.0	0.0	0.1	5.4	0.2	0.0	0.0
SD-W	0.0	0.4	0.0	0.8	0.5	0.0	0.1	0.0	0.0	0.0	0.1	0.5	0.1	0.0	0.0	0.0
SD-E	0.0	2.0	0.0	1.6	1.9	1.4	1.9	0.0	0.0	0.0	0.0	0.3	3.4	0.0	0.0	0.0
WY-E	0.0	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.0	0.0	0.0	0.0
NEB-W	0.0	0.2	0.7	1.0	0.8	0.1	0.0	0.0	0.0	0.0	0.2	1.1	0.0	0.0	0.0	0.0
NEB-E	0.0	1.3	1.1	2.8	2.0	0.9	0.1	0.0	0.0	0.0	0.2	0.4	1.0	0.0	0.0	0.0
CO-E	0.0	0.5	0.4	0.4	0.5	0.1	0.5	0.0	0.0	0.0	0.0	82.6	0.0	0.0	0.0	0.0
KS-W	0.0	0.5	0.3	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
KS-E	0.0	1.8	0.6	2.3	2.0	1.2	0.6	0.0	0.0	0.0	0.1	0.7	0.6	0.0	0.0	0.0
NM-E	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	3.0	0.0	0.0	0.0	0.0
OK-W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OK-E	0.0	1.2	0.9	1.5	1.0	0.4	0.7	0.0	0.0	0.0	0.1	0.4	0.6	0.1	0.0	0.0
TX-W	0.0	0.2	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
TX-E	0.0	1.3	1.1	3.3	4.0	1.1	2.1	0.0	0.0	0.0	0.1	1.0	1.0	0.1	0.0	0.0
MN	0.0	0.6	0.0	0.4	0.9	3.7	14.6	0.0	0.0	0.0	0.1	0.1	43.4	9.7	0.0	0.1
WISC	0.0	0.2	0.0	0.1	0.3	1.2	6.2	0.3	0.0	0.0	0.1	0.0	3.1	45.8	0.3	0.0
MICH	0.0	0.0	0.0	0.1	0.5	0.2	2.4	2.8	0.0	0.0	0.0	0.0	0.6	16.2	0.7	0.3

Table 17. Continued.

Harvest area of recovery	N PAC 1	N ALTA N NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16
	Major reference area of banding															
IOWA	0.0	1.4	0.3	2.2	1.8	2.6	5.5	0.0	0.0	0.0	0.0	0.1	7.8	3.1	0.1	0.0
ILL	0.0	2.9	0.0	3.9	3.4	4.8	7.8	0.3	0.0	0.0	0.0	0.1	5.0	4.9	0.4	0.1
IND	0.0	0.0	0.0	0.1	0.0	0.3	0.3	0.4	0.0	0.0	0.0	0.0	0.5	1.6	0.6	0.0
OHIO	0.0	0.0	0.0	0.0	0.0	0.1	0.0	1.3	0.0	0.0	0.0	0.0	0.1	2.6	7.6	0.3
MO	0.0	3.3	0.3	4.2	4.6	3.5	4.2	0.0	0.0	0.0	0.0	0.4	3.0	0.7	0.0	0.0
KY	0.0	0.1	0.0	0.3	0.9	0.3	0.8	0.8	0.0	0.0	0.0	0.0	0.3	0.9	0.4	0.2
ARK	0.0	4.1	2.0	10.0	11.5	6.4	7.0	0.5	0.0	0.0	0.1	1.4	6.0	1.7	0.3	0.3
TENN	0.0	0.4	0.0	1.4	1.2	1.3	1.9	1.5	0.0	0.0	0.0	0.1	1.2	1.5	1.1	0.4
LA	0.0	4.2	3.1	8.5	8.9	4.7	3.7	0.3	0.0	0.0	0.2	0.8	3.5	0.9	0.2	0.1
MISS	0.0	1.0	0.7	2.4	1.6	2.0	2.3	0.5	0.0	0.0	0.0	0.3	1.7	1.0	0.2	0.1
ALAB	0.0	0.0	0.2	0.0	0.0	0.3	0.3	0.5	0.0	0.0	0.0	0.1	0.3	0.7	0.4	0.2
ME	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2
VT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	11.1
N H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
MASS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.4
CT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.2
R I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
N Y	0.0	0.0	0.0	0.0	0.0	0.0	0.2	5.3	0.0	0.0	0.0	0.0	0.0	0.2	55.3	37.8
PA	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.4	0.0	0.0	0.0	0.0	0.1	0.4	8.1	1.0
W V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
N J	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.2	3.2	3.3
DEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.1	2.3	1.7
MD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.2	3.9	2.8
VA	0.0	0.0	0.0	0.0	0.3	0.3	0.7	1.5	0.0	0.0	0.0	0.0	0.2	0.6	3.0	2.2
N C	0.0	0.0	0.0	0.0	0.0	0.1	0.0	1.5	0.0	0.0	0.0	0.0	0.1	0.6	2.2	2.0
S C	0.0	0.0	0.0	0.1	0.6	0.2	0.1	1.5	0.0	0.0	0.0	0.0	0.3	1.3	2.1	1.5
GA	0.0	0.0	0.0	0.1	0.3	0.0	0.2	0.2	0.0	0.0	0.0	0.1	0.1	0.3	0.4	0.3
FL	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
Ak-Canada	63.1	48.9	59.2	45.8	46.8	59.3	34.0	75.0	4.1	0.0	0.5	0.6	8.1	4.4	6.8	22.9
Pacific	36.9	19.9	26.2	4.0	0.0	0.1	0.1	0.0	95.9	100.0	97.8	3.2	0.1	0.0	0.0	0.0
Central	0.0	13.0	7.9	16.4	16.3	8.4	7.7	0.0	0.0	0.0	1.3	92.9	14.4	0.5	0.0	0.0
High	(0.0)	(3.8)	(4.1)	(3.8)	(3.2)	(1.4)	(1 2)	(0.0)	(0.0)	(0.0)	(0.8)	(90.0)	(3.5)	(0.0)	(0.0)	(0.0)
Low	(0.0)	(9.2)	(3.7)	(12.4)	(13.1)	(7.1)	(6.4)	(0.0)	(0.0)	(0.0)	(0.7)	(2.9)	(11.1)	(0.4)	(0.0)	(0.0)
Miss.	0.0	18.2	6.7	33.5	35.6	31.4	56.9	9.2	0.0	0.0	0.4	3.3	76.5	91.1	12.3	2.0
Atlantic	0.0	0.0	0.0	0.2	1.3	0.8	1.3	15.8	0.0	0.0	0.0	0.1	0.9	4.1	80.9	75.1
Total pct	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N actual	99	736	470	1389	373	1347	489	6069	2945	1060	1367	1955	4145	7686	2470	2319
N adj.	179	1393	912	2707	738	3129	984	15135	5246	2136	2532	3614	8843	17403	5469	5587

[a]Harvest distribution was based on direct immature male and female recoveries (N actual) that were each adjusted for band reporting rate (N adj.).

Table 18. Percent distribution of the total mallard harvest from major reference areas to harvest areas within the United States and Canada (1961-75 hunting seasons combined).[a]

Harvest area of recovery	Major reference area of banding															
	N PAC 1	N ALTA N NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16
AK	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
YUK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BC	44.6	1.3	0.4	0.1	0.0	0.0	0.0	0.0	3.6	0.2	0.1	0.0	0.0	0.0	0.0	0.0
NWTM	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ALTA	2.3	18.9	28.6	5.1	0.8	0.4	0.5	0.0	1.0	0.3	2.4	1.3	0.4	0.1	0.0	0.0
SASK	0.0	6.3	1.3	19.8	22.7	3.4	5.2	0.3	0.1	0.0	0.4	1.7	1.8	0.6	0.2	0.1
MAN	0.0	0.9	0.5	1.0	2.1	34.1	12.1	0.4	0.0	0.0	0.0	0.3	5.1	1.1	0.4	0.4
ONT	0.0	0.1	0.0	0.2	0.5	0.7	8.8	51.8	0.0	0.0	0.0	0.0	1.2	4.7	6.8	15.9
QUE	0.0	0.0	0.1	0.0	0.0	0.0	0.0	8.5	0.0	0.0	0.0	0.0	0.0	0.1	0.4	5.4
N B	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PEI	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
N S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
WA	28.7	10.7	11.3	1.3	0.0	0.0	0.0	0.0	45.2	0.7	3.1	0.2	0.1	0.0	0.0	0.0
OR	11.0	3.3	4.0	0.5	0.0	0.0	0.1	0.0	35.4	7.2	3.3	0.1	0.0	0.0	0.0	0.0
ID	3.4	3.4	11.5	1.7	0.5	0.1	0.1	0.0	2.2	0.5	36.0	0.9	0.1	0.0	0.0	0.0
MT-W	0.0	0.7	2.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	14.1	0.1	0.0	0.0	0.0	0.0
WY-W	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
CA	3.8	1.5	2.7	0.4	0.1	0.1	0.0	0.0	11.2	90.7	4.1	0.2	0.0	0.0	0.0	0.0
NV	0.0	0.2	0.4	0.1	0.0	0.0	0.0	0.0	0.5	0.2	8.4	0.1	0.0	0.0	0.0	0.0
UTAH	0.0	0.5	0.8	0.2	0.0	0.0	0.0	0.0	0.1	0.0	12.8	0.8	0.0	0.0	0.0	0.0
CO-W	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2	1.1	0.0	0.0	0.0	0.0
AZ	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.4	0.0	0.0	0.0	0.0
NM-W	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.0	0.0	0.0	0.0
MT-E	0.0	0.8	2.1	0.6	0.3	0.1	0.0	0.0	0.0	0.0	0.3	2.4	0.1	0.0	0.0	0.0
ND-W	0.0	1.2	0.2	1.2	0.7	1.2	0.4	0.2	0.0	0.0	0.0	0.6	3.7	0.2	0.0	0.0
ND-E	1.0	1.5	0.5	1.7	1.9	3.0	1.4	0.4	0.0	0.0	0.0	0.5	5.4	1.0	0.4	0.2
SD-W	0.0	0.7	0.3	0.6	0.5	0.1	0.3	0.0	0.0	0.0	0.1	0.5	0.2	0.0	0.0	0.0
SD-E	0.0	1.8	0.8	2.2	2.6	1.4	1.8	0.2	0.0	0.0	0.2	0.9	4.8	0.4	0.2	0.1
WY-E	0.5	1.1	3.7	0.8	0.2	0.0	0.0	0.0	0.3	0.1	9.3	1.4	0.1	0.0	0.0	0.0
NEB-W	0.0	2.0	4.0	2.2	1.3	0.2	0.0	0.0	0.0	0.0	0.6	3.0	0.4	0.0	0.0	0.0
NEB-E	1.0	2.5	2.0	3.4	3.8	1.6	0.9	0.0	0.0	0.0	0.1	1.5	1.8	0.1	0.0	0.0
CO-E	0.0	2.2	3.8	2.0	0.8	0.1	0.3	0.0	0.0	0.0	0.9	64.0	0.3	0.0	0.0	0.0
KS-W	0.0	0.4	0.2	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.0	0.0	0.0
KS-E	0.0	2.5	2.4	3.4	3.3	1.6	1.0	0.0	0.0	0.0	0.1	1.2	1.2	0.1	0.0	0.0
NM-E	0.0	0.1	0.6	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.3	3.9	0.0	0.0	0.0	0.0
OK-W	0.0	0.1	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.4	1.3	0.0	0.0	0.0	0.0
OK-E	0.0	1.6	1.6	3.1	2.6	1.1	0.6	0.0	0.0	0.0	0.2	0.9	1.4	0.1	0.0	0.0
TX-W	0.0	0.4	0.7	0.5	0.1	0.1	0.0	0.0	0.0	0.0	0.1	1.6	0.1	0.0	0.0	0.0
TX-E	0.5	2.5	2.2	4.4	3.3	1.5	1.8	0.0	0.0	0.0	0.3	1.7	2.0	0.2	0.0	0.0
MN	0.0	1.4	0.1	1.7	3.1	4.4	11.4	0.9	0.0	0.0	0.1	0.3	23.3	8.5	1.3	0.7
WISC	0.0	0.4	0.1	0.5	1.0	2.2	5.8	1.1	0.0	0.0	0.0	0.1	3.6	34.8	1.5	0.5
MICH	0.0	0.1	0.1	0.2	0.4	0.6	3.1	3.2	0.0	0.0	0.0	0.0	0.9	13.7	1.7	0.7

Table 18. Continued.

Harvest area of recovery	N PAC 1	N ALTA N NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16
	Major reference area of banding															
IOWA	0.3	2.6	0.7	3.0	3.8	3.2	5.5	0.3	0.0	0.0	0.0	0.4	5.7	2.4	0.3	0.2
ILL	0.5	2.9	0.4	3.7	5.5	6.8	8.2	0.9	0.0	0.0	0.0	0.3	6.2	6.2	1.0	0.5
IND	0.0	0.1	0.1	0.2	0.4	0.5	0.9	0.5	0.0	0.0	0.0	0.0	0.7	1.8	0.6	0.1
OHIO	0.0	0.0	0.0	0.1	0.1	0.3	0.5	1.8	0.0	0.0	0.0	0.0	0.4	3.3	7.2	0.5
MO	0.3	3.9	1.4	5.0	4.9	4.5	4.7	0.2	0.0	0.0	0.1	0.7	4.0	0.9	0.2	0.1
KY	0.0	0.2	0.2	0.4	0.5	0.6	1.2	1.0	0.0	0.0	0.0	0.0	0.6	1.1	0.6	0.2
ARK	0.5	7.3	4.5	13.1	14.5	10.8	8.1	1.0	0.0	0.0	0.3	2.5	10.8	3.0	0.6	0.4
TENN	0.0	1.0	0.1	1.6	1.7	2.5	3.3	2.1	0.0	0.0	0.0	0.2	1.9	2.8	1.8	0.6
LA	0.0	5.8	2.6	9.0	10.4	6.4	4.4	0.5	0.0	0.0	0.1	1.6	5.9	1.7	0.4	0.1
MISS	0.0	1.9	0.5	3.6	3.3	3.9	3.6	1.0	0.0	0.0	0.0	0.4	2.9	1.8	0.5	0.2
ALAB	0.0	0.1	0.1	0.2	0.4	0.5	0.3	0.9	0.0	0.0	0.0	0.1	0.5	1.1	0.6	0.1
ME	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6
VT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	8.3
N H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
MASS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	6.6
CT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.4
R I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9
N Y	0.0	0.0	0.0	0.0	0.0	0.1	0.6	5.5	0.0	0.0	0.0	0.0	0.1	0.4	34.9	30.5
PA	0.0	0.0	0.0	0.0	0.0	0.2	0.6	2.8	0.0	0.0	0.0	0.0	0.2	0.8	13.4	2.9
W V	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1
N J	0.0	0.0	0.0	0.0	0.0	0.1	0.0	1.7	0.0	0.0	0.0	0.0	0.1	0.3	3.8	5.4
DEL	0.0	0.0	0.0	0.0	0.1	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.1	0.3	2.9	2.5
MD	0.0	0.0	0.0	0.1	0.2	0.1	0.5	2.2	0.0	0.0	0.0	0.0	0.2	0.5	5.6	4.0
VA	0.0	0.1	0.0	0.1	0.2	0.3	0.5	2.6	0.0	0.0	0.0	0.0	0.4	1.1	4.7	3.4
N C	0.0	0.0	0.0	0.0	0.0	0.1	0.2	2.0	0.0	0.0	0.0	0.0	0.2	1.0	2.7	2.2
S C	0.0	0.0	0.1	0.2	0.3	0.4	0.5	2.5	0.0	0.0	0.0	0.1	0.7	2.5	3.7	1.9
GA	0.0	0.1	0.0	0.1	0.2	0.2	0.6	0.5	0.0	0.0	0.0	0.0	0.2	0.6	0.5	0.5
FL	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2
Ak-Canada	48.5	30.0	30.9	26.2	26.2	38.7	26.7	61.0	4.9	0.5	3.0	3.3	8.6	6.5	7.9	21.8
Pacific	46.9	20.3	33.0	4.5	0.7	0.2	0.3	0.0	94.7	99.3	83.2	4.3	0.2	0.0	0.0	0.0
Central	3.1	21.5	25.4	26.6	21.9	12.1	8.4	0.8	0.3	0.1	13.0	85.7	21.5	2.2	0.7	0.4
High	(0.6)	(9.1)	(15.9)	(8.4)	(4.4)	(1.9)	(0.9)	(0.2)	(0.3)	(0.1)	(12.1)	(79.0)	(4.9)	(0.3)	(0.1)	(0.1)
Low	(2.5)	(12.4)	(9.5)	(18.2)	(17.5)	(10.2)	(7.5)	(0.6)	(0.0)	(0.0)	(0.9)	(6.7)	(16.6)	(1.9)	(0.6)	(0.3)
Miss.	1.5	27.9	10.6	42.1	50.1	47.2	60.8	15.3	0.1	0.1	0.8	6.6	67.4	83.3	18.4	4.8
Atlantic	0.0	0.3	0.1	0.6	1.1	1.7	3.8	22.8	0.0	0.0	0.0	0.1	2.3	8.0	73.0	72.9
Total pct	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N actual	226	2279	2220	6318	1774	4664	1002	12002	6680	3738	4962	8023	13998	18442	5949	4520
N adj.	385	4223	4011	12109	3469	10001	2006	28807	11849	6883	8773	14965	28313	40045	12980	10529

[a]Harvest distribution was based on direct and indirect recoveries (N actual) of all age and sex classes, except locals, that were each adjusted for band reporting rate (N adj.).

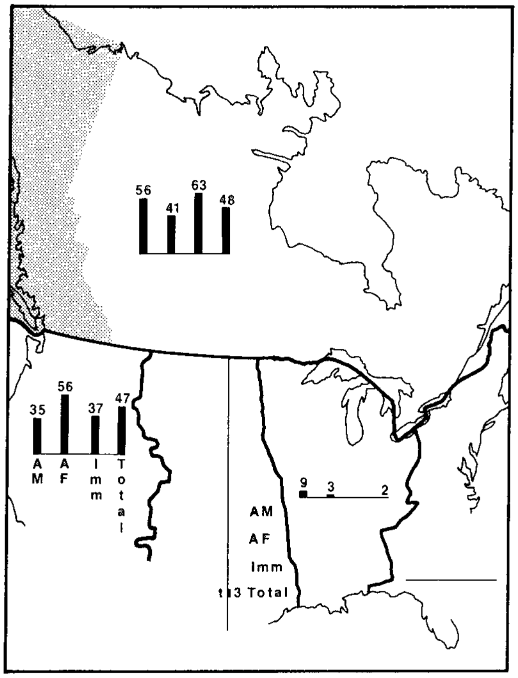

Fig. 2. Percent distribution of the mallard harvest among flyways (including Alaska-Canada and the 100th meridian division in the Central Flyway) from the *N Pacific* major reference area (shaded). AM = adult male, AF = adult female, Imm = immature, t = trace percentages (less than 1.0%).

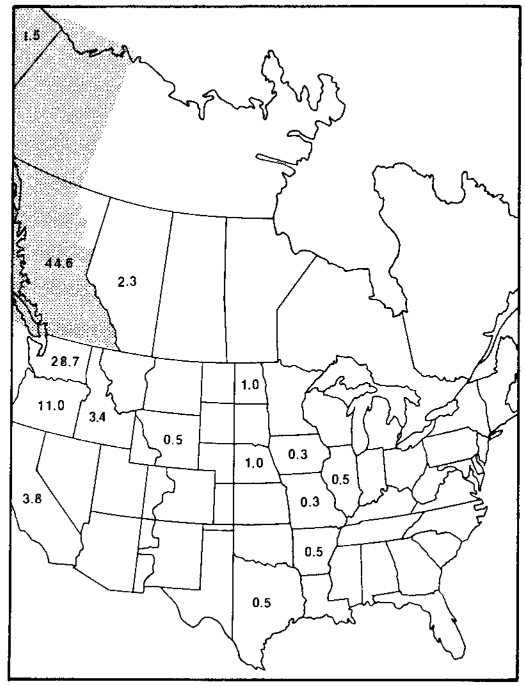

Fig. 3. Percent distribution of the mallard harvest from the *N Pacific* major reference area (shaded) to harvest areas within the United States and Canada.

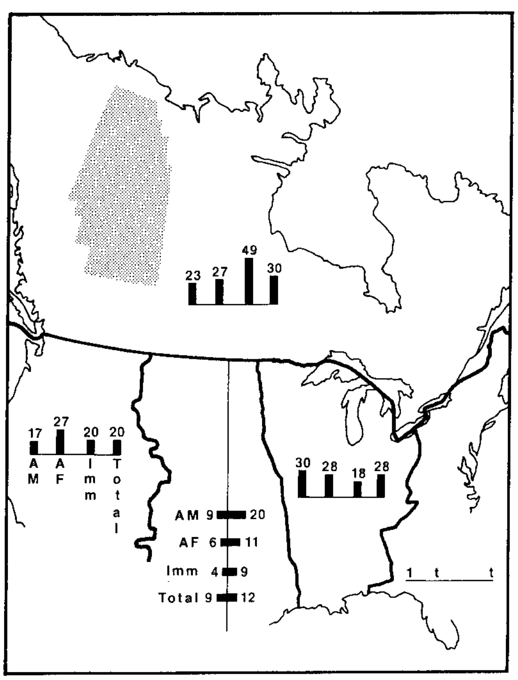

Fig. 4. Percent distribution of the mallard harvest among flyways (including Alaska-Canada and the 100th meridian division in the Central Flyway) from the *N Alberta-N Northwest Territories* major reference area (shaded). AM = adult male, AF = adult female, Imm = immature, t = trace percentages (less than 1.0%).

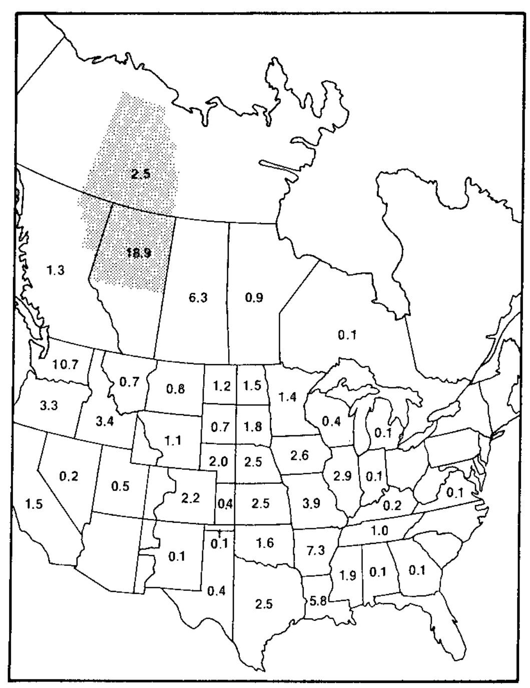

Fig. 5. Percent distribution of the mallard harvest from the *N Alberta-N Northwest Territories* major reference area (shaded) to harvest areas within the United States and Canada.

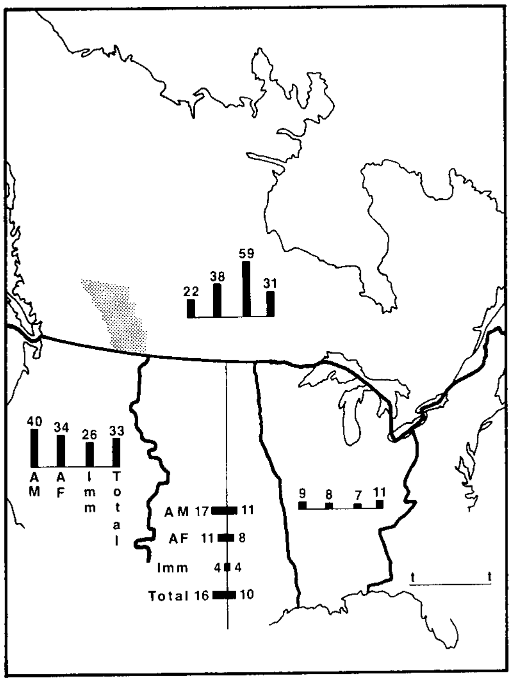

Fig. 6. Percent distribution of the mallard harvest among flyways (including Alaska–Canada and the 100th meridian division in the Central Flyway) from the SW *Alberta* major reference area (shaded). AM = adult male, AF = adult female, Imm = immature, t = trace percentages (less than 1.0%).

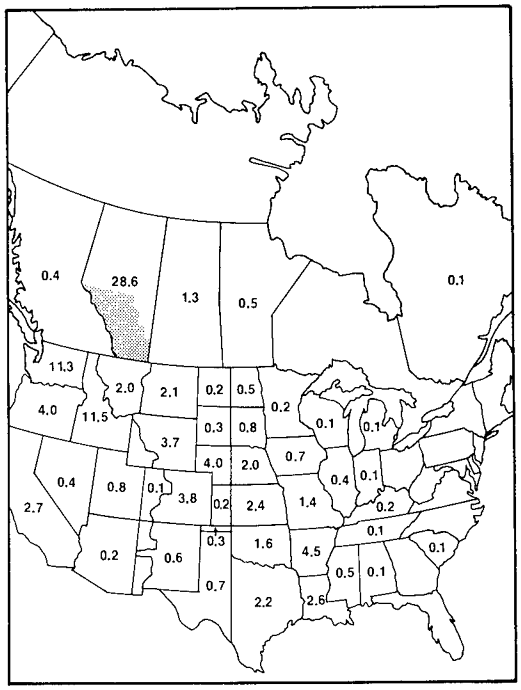

Fig. 7. Percent distribution of the mallard harvest from the SW *Alberta* major reference area (shaded) to harvest areas within the United States and Canada.

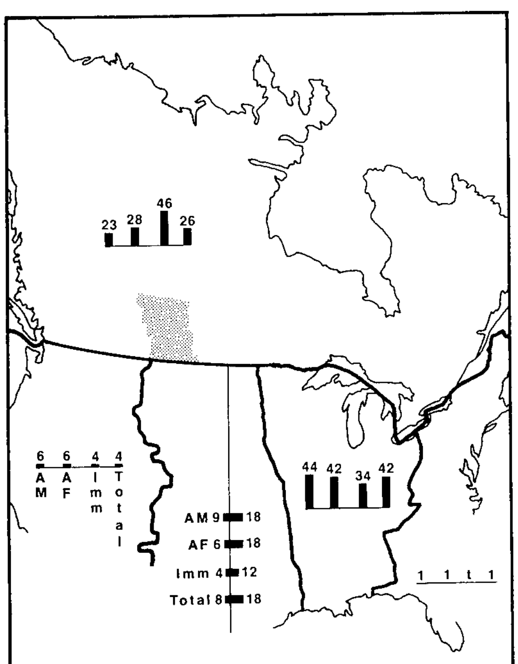

Fig. 8. Percent distribution of the mallard harvest among flyways (including Alaska–Canada and the 100th meridian division in the Central Flyway) from the SW *Saskatchewan* major reference area (shaded). AM = adult male, AF = adult female, Imm = immature, t = trace percentages (less than 1.0%).

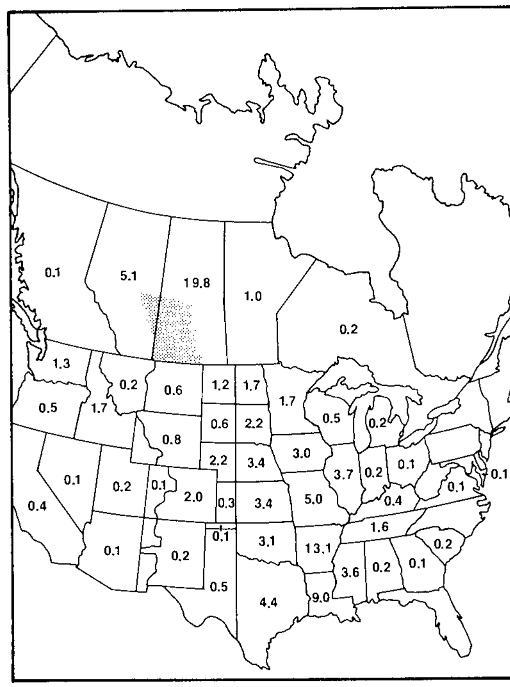

Fig. 9. Percent distribution of the mallard harvest from the SW *Saskatchewan* major reference area (shaded) to harvest areas within the United States and Canada.

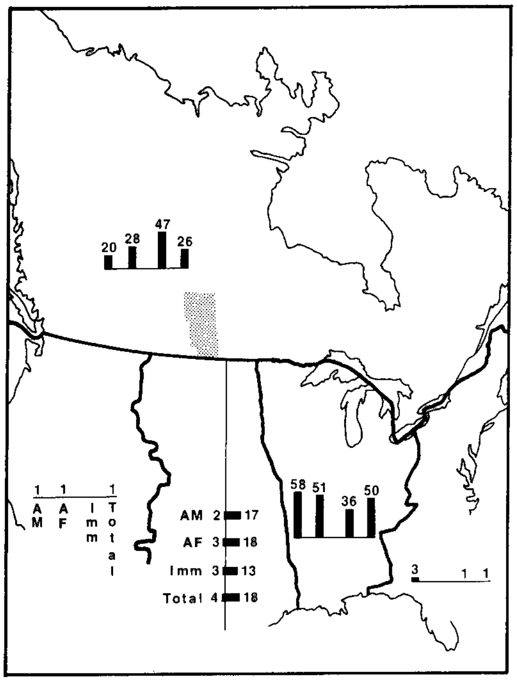

Fig. 10. Percent distribution of the mallard harvest among flyways (including Alaska–Canada and the 100th meridian division in the Central Flyway) from the *SE Saskatchewan* major reference area (shaded). AM = adult male, AF = adult female, Imm = immature, t = trace percentages (less than 1.0%).

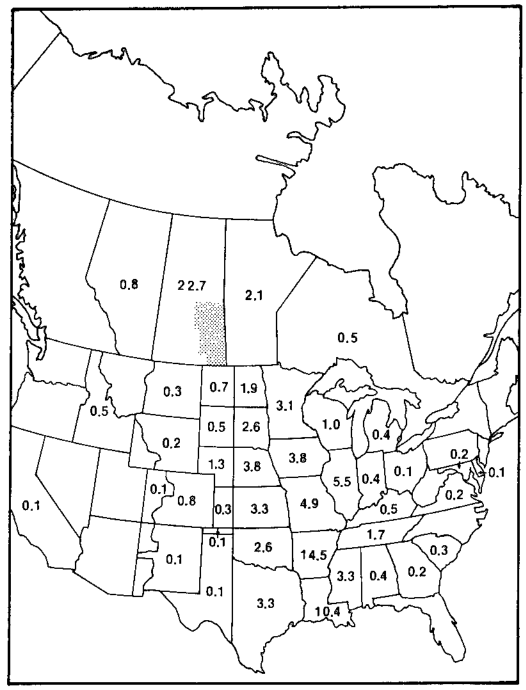

Fig. 11. Percent distribution of the mallard harvest from the *SE Saskatchewan* major reference area (shaded) to harvest areas within the United States and Canada.

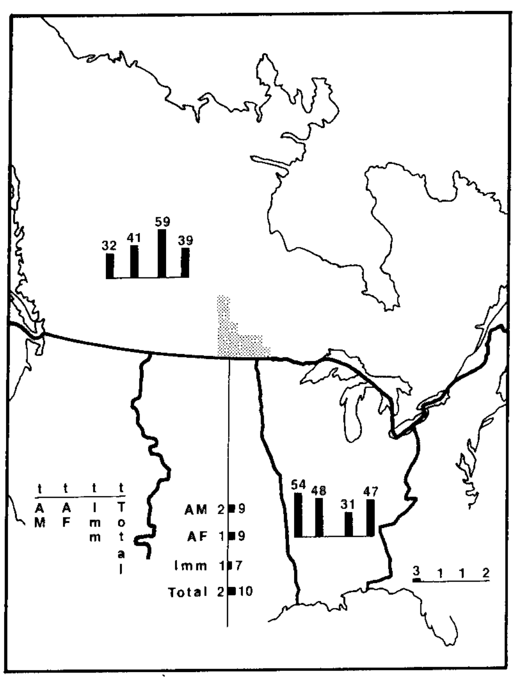

Fig. 12. Percent distribution of the mallard harvest among flyways (including Alaska–Canada and the 100th meridian division in the Central Flyway) from the *SW Manitoba* major reference area (shaded). AM = adult male, AF = adult female, Imm = immature, t = trace percentages (less than 1.0%).

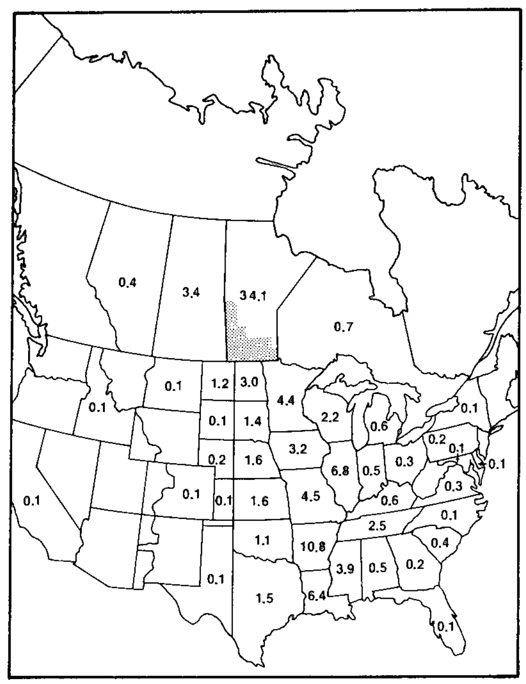

Fig. 13. Percent distribution of the mallard harvest from the *SW Manitoba* major reference area (shaded) to harvest areas within the United States and Canada.

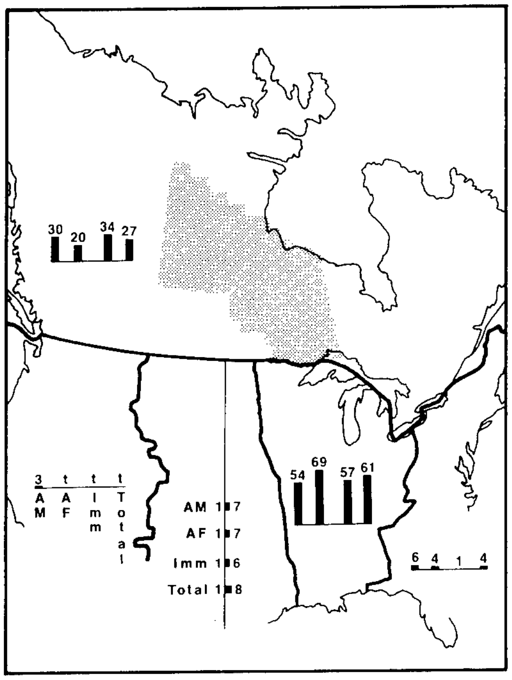

Fig. 14. Percent distribution of the mallard harvest among flyways (including Alaska-Canada and the 100th meridian division in the Central Flyway) from the *N Saskatchewan-N Manitoba-W Ontario* major reference area (shaded). AM = adult male, AF = adult female, Imm = immature, t = trace percentages (less than 1.0%).

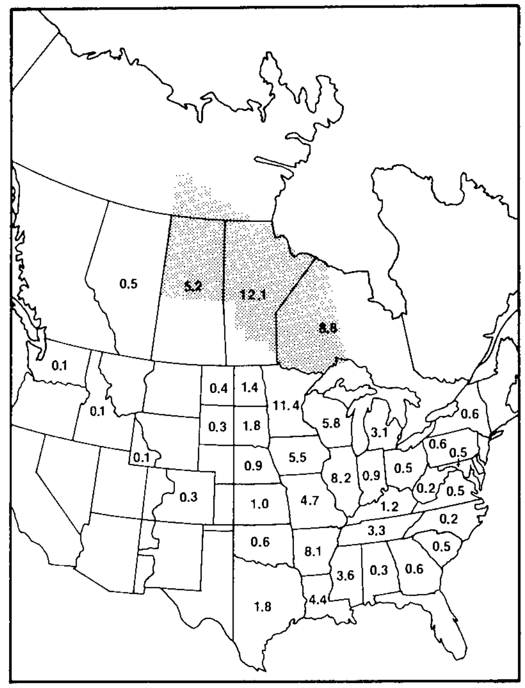

Fig. 15. Percent distribution of the mallard harvest from the *N Saskatchewan-N Manitoba-W Ontario* major reference area (shaded) to harvest areas within the United States and Canada.

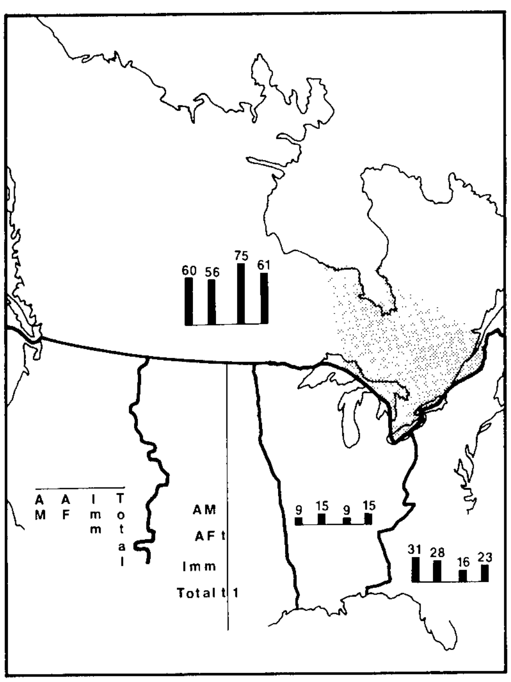

Fig. 16. Percent distribution of the mallard harvest among flyways (including Alaska-Canada and the 100th meridian division in the Central Flyway) from the *E Ontario-W Quebec* major reference area (shaded). AM = adult male, AF = adult female, Imm = immature, t = trace percentages (less than 1.0%).

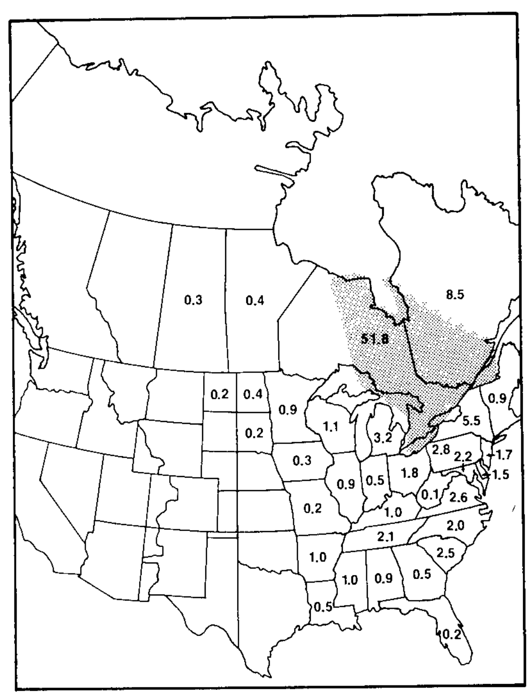

Fig. 17. Percent distribution of the mallard harvest from the *E Ontario-W Quebec* major reference area (shaded) to harvest areas within the United States and Canada.

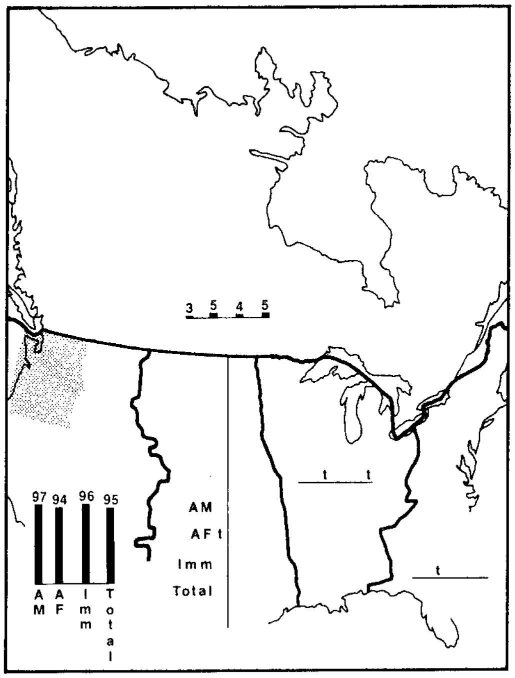

Fig. 18. Percent distribution of the mallard harvest among flyways (including Alaska-Canada and the 100th meridian division in the Central Flyway) from the *Washington – Oregon* major reference area (shaded). AM = adult male, AF = adult female, Imm = immature, t = trace percentages (less than 1.0%).

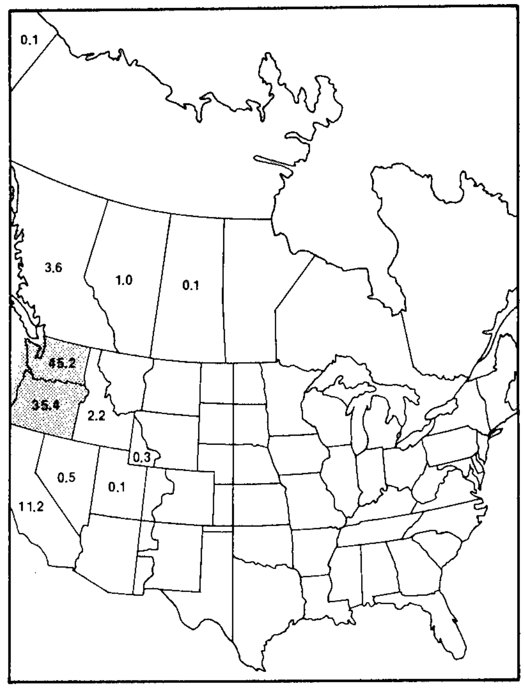

Fig. 19. Percent distribution of the mallard harvest from the *Washington–Oregon* major reference area (shaded) to harvest areas within the United States and Canada.

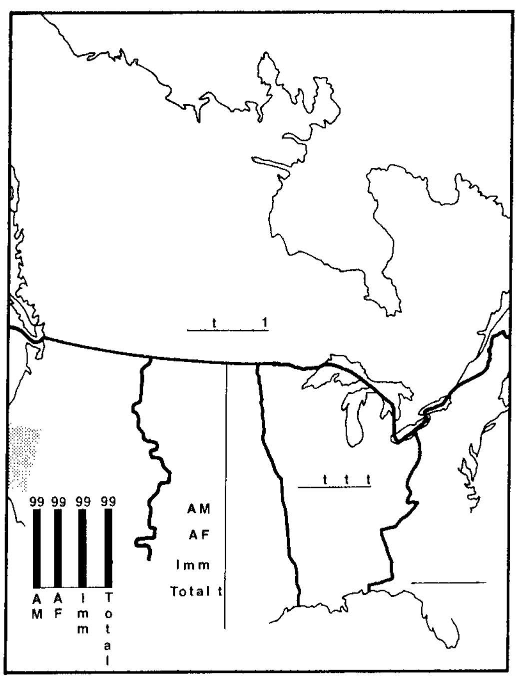

Fig. 20. Percent distribution of the mallard harvest among flyways (including Alaska-Canada and the 100th meridian division in the Central Flyway) from the *N California* major reference area (shaded). AM = adult male, AF = adult female, Imm = immature, t = trace percentages (less than 1.0%).

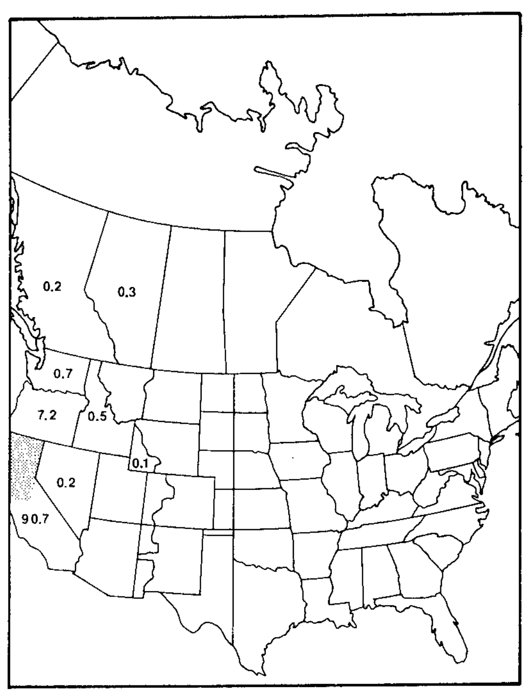

Fig. 21. Percent distribution of the mallard harvest from the *N California* major reference area (shaded) to harvest areas within the United States and Canada.

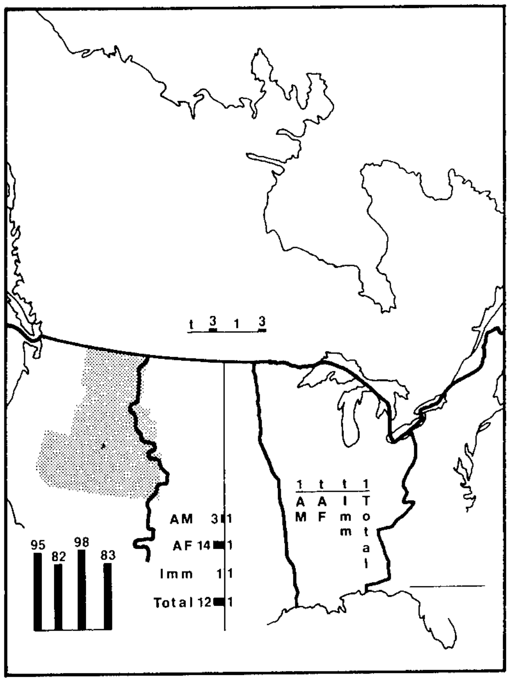

Fig. 22. Percent distribution of the mallard harvest among flyways (including Alaska–Canada and the 100th meridian division in the Central Flyway) from the *Intermountain* major reference area (shaded). AM = adult male, AF = adult female, Imm = immature, t = trace percentages (less than 1.0%).

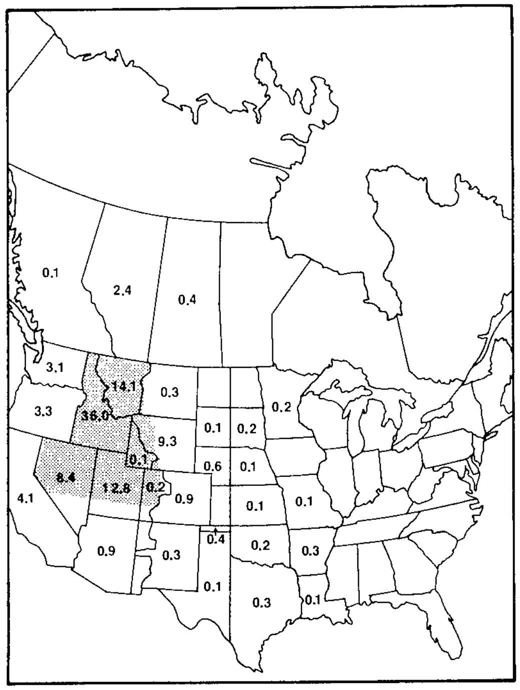

Fig. 23. Percent distribution of the mallard harvest from the *Intermountain* major reference area (shaded) to harvest areas within the United States and Canada.

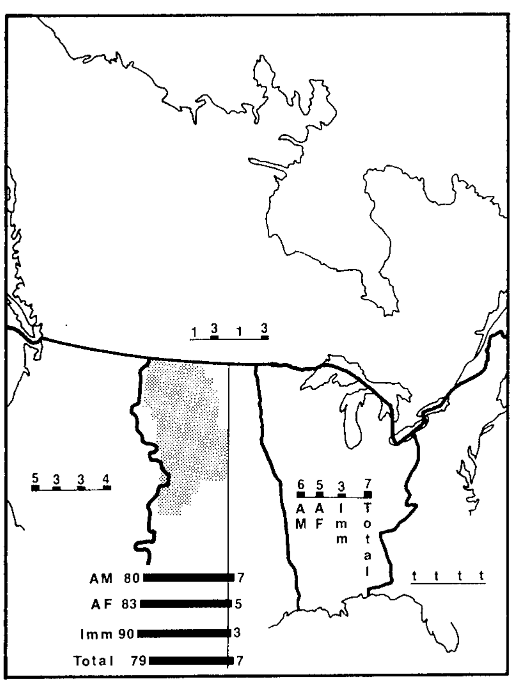

Fig. 24. Percent distribution of the mallard harvest among flyways (including Alaska–Canada and the 100th meridian division in the Central Flyway) from the *High Plains* major reference area (shaded). AM = adult male, AF = adult female, Imm = immature, t = trace percentages (less than 1.0%).

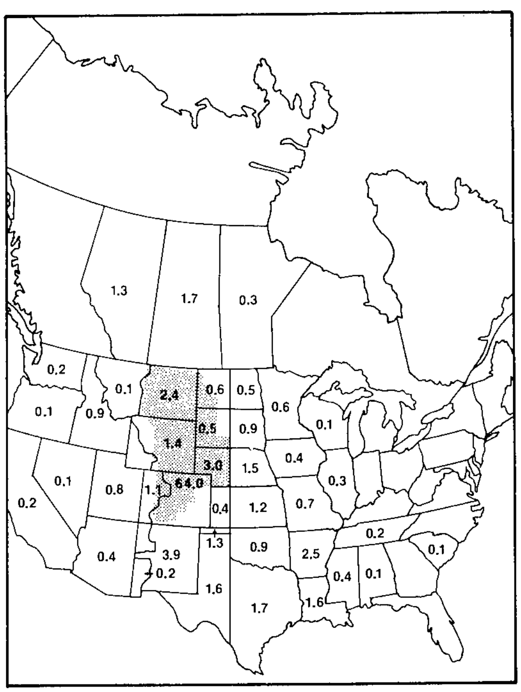

Fig. 25. Percent distribution of the mallard harvest from the *High Plains* major reference area (shaded) to harvest areas within the United States and Canada.

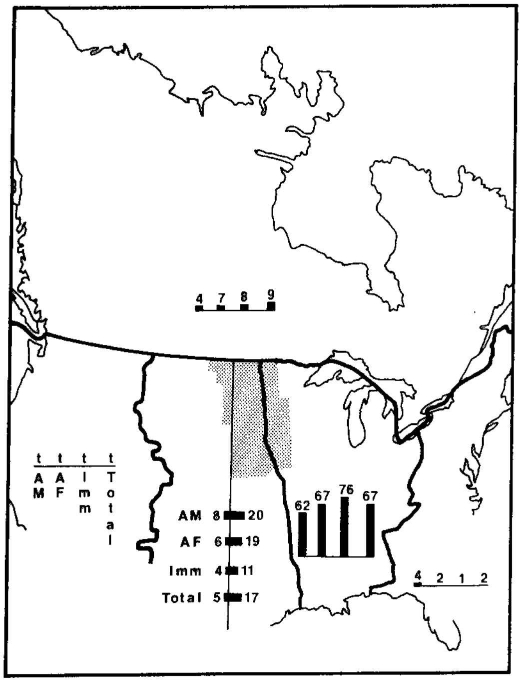

Fig. 26. Percent distribution of the mallard harvest among flyways (including Alaska–Canada and the 100th meridian division in the Central Flyway) from the *Missouri River Basin* major reference area (shaded). AM = adult male, AF = adult female, Imm = immature, t = trace percentages (less than 1.0%).

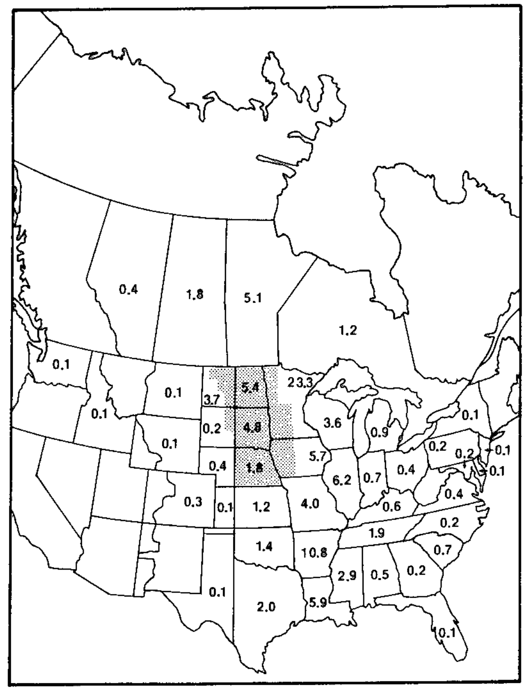

Fig. 27. Percent distribution of the mallard harvest from the *Missouri River Basin* major reference area (shaded) to harvest areas within the United States and Canada.

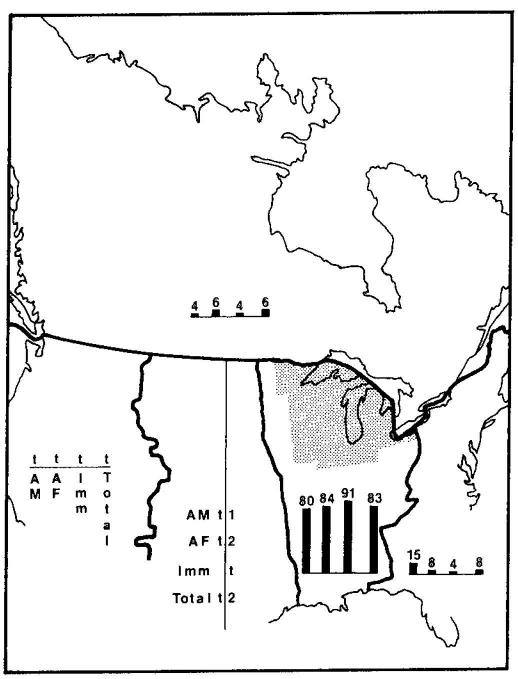

Fig. 28. Percent distribution of the mallard harvest among flyways (including Alaska–Canada and the 100th meridian division in the Central Flyway) from the *Great Lakes* major reference area (shaded). AM = adult male, AF = adult female, Imm = immature, t = trace percentages (less than 1.0%).

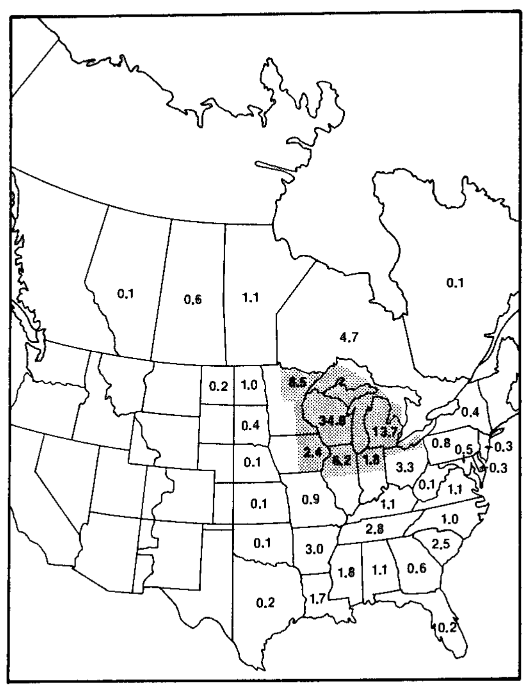

Fig. 29. Percent distribution of the mallard harvest from the *Great Lakes* major reference area (shaded) to harvest areas within the United States and Canada.

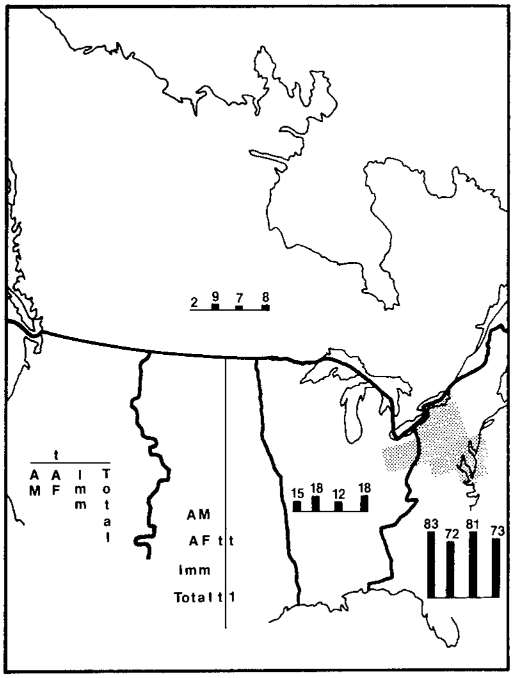

Fig. 30. Percent distribution of the mallard harvest among flyways (including Alaska–Canada and the 100th meridian division in the Central Flyway) from the *Mid-Atlantic* major reference area (shaded). AM = adult male, AF = adult female, Imm = immature, t = trace percentages (less than 1.0%).

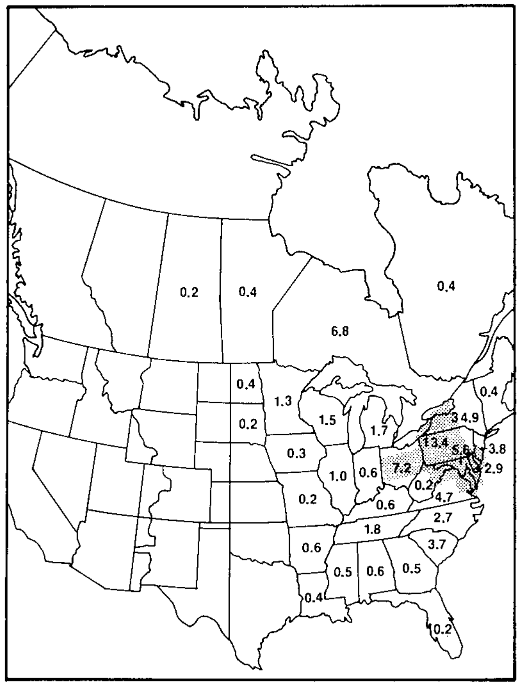

Fig. 31. Percent distribution of the mallard harvest from the *Mid-Atlantic* major reference area (shaded) to harvest areas within the United States and Canada.

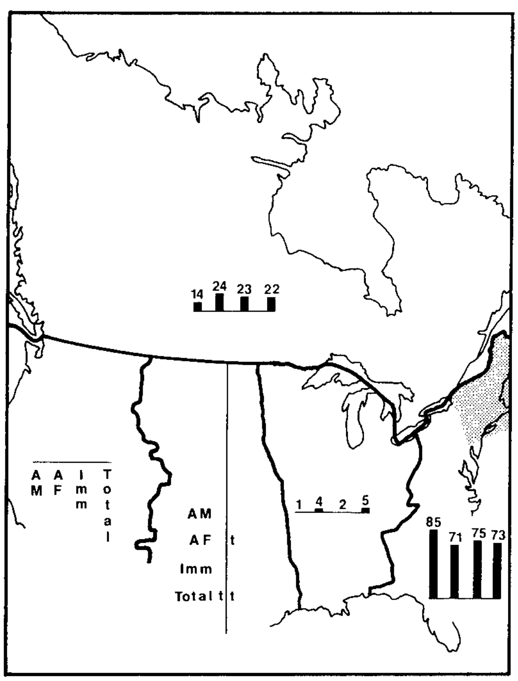

Fig. 32. Percent distribution of the mallard harvest among flyways (including Alaska–Canada and the 100th meridian division in the Central Flyway) from the *NE United States* major reference area (shaded). AM = adult male, AF = adult female, Imm = immature, t = trace percentages (less than 1.0%).

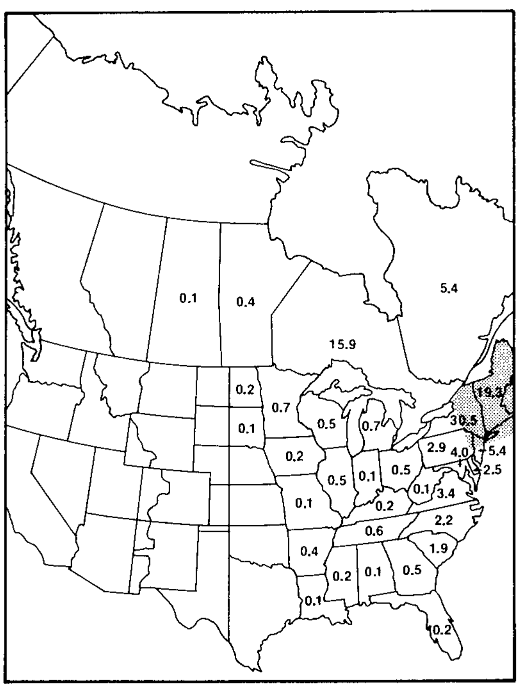

Fig. 33. Percent distribution of the mallard harvest from the *NE United States* major reference area (shaded) to harvest areas within the United States and Canada.

Table 19. Percent distribution of the total mallard harvest in the contiguous United States comparing estimates from preseason banding data (1961-75) with estimates from harvest survey data (1966-75).

Harvest area	Banding data	Harvest data[a]	Harvest area	Banding data	Harvest data
Pacific Flyway			Central Flyway		
WA	7.4	6.8	MT-E	0.7	0.7
OR	3.5	3.4	N D	3.4	4.1
ID	4.2	5.2	S D	2.6	3.0
MT-W	0.9	2.0	WY-E	1.3	0.5
WY-W	tr	0.2	NEB	4.1	3.2
CA	3.6	7.2	CO-E	7.4	2.1
NV	0.4	0.7	KS	2.5	2.9
UTAH	0.8	2.0	NM-E	0.5	0.2
CO-W	0.1	0.4	OK	2.0	1.8
AZ	0.1	0.2	TX	3.3	2.8
NM-W	tr	tr			
Total	21.0	28.0		27.8	21.2
Mississippi Flyway			Atlantic Flyway		
MN	6.0	6.1	ME	tr	0.1
WISC	3.7	4.5	VT	0.1	0.1
MICH	1.8	2.6	N H	tr	0.1
IOWA	3.4	2.7	MASS	0.1	0.3
ILL	4.7	4.1	CT	tr	0.2
IND	0.5	0.7	R I	tr	tr
OHIO	0.5	0.9	N Y	0.9	1.9
MO	4.0	2.9	PA	0.6	1.4
KY	0.6	0.6	W V	0.1	tr
ARK	9.6	8.4	N J	0.2	0.6
TENN	2.0	1.8	DEL	0.2	0.3
LA	6.5	5.4	MD	0.4	0.8
MISS	2.9	2.2	VA	0.5	0.5
ALAB	0.4	0.4	N C	0.3	0.4
			S C	0.7	0.5
			GA	0.3	0.2
			FL	0.1	0.1
Total	46.6	43.3		4.5	7.4

[a]Carney et al. (1978).

more of the total mallard harvest (see Table 23): (1) a map showing percent derivation of harvest from each of the reference areas, and (2) an adjoining map showing harvest derivation similarity indices (see Methods) between the harvest area and other areas. The New England States have been combined on the similarity maps. Instead of discussing harvest derivation for every area, we will limit our discussion to selected, representative areas.

Alberta. — The *N Alberta–N Northwest Territories* and *SW Alberta* reference areas accounted for 78.7% of the harvest in Alberta (Fig. D-3). Alberta is similar in harvest derivation to States in both the Pacific and Central flyways, which is indicated by similarity indices equal to or greater than 50 (shaded) in Washington, Idaho, Eastern Montana, Eastern Wyoming, and the western portions of South Dakota, Nebraska, Kansas, and Texas (Fig. D-4).

Saskatchewan. — More than 75% of the mallard harvest in this area is derived from within the Province. With the exception of Minnesota, adjoining States on the Central–Mississippi Flyway boundary were most similar to Saskatchewan in harvest derivation (Fig. D-6).

Manitoba. — Locally derived birds from *SW Manitoba* comprised 40% of the total mallard harvest. Mississippi Flyway States were most prominent in sharing common sources of harvest with Manitoba (Fig. D-8).

Ontario. — States in the Atlantic Flyway, particularly from Pennsylvania south to North Carolina, were associated with Ontario in harvest derivation (Fig. D-10).

Washington and Oregon. — The three westernmost breeding reference areas in Canada accounted for 79% of the harvest in Washington (Fig. D-11) and 63% of the harvest in Oregon (Fig. D-13). Most of the remainder of the

harvest came from the reference area comprised of these two States.

California. – This harvest area, which totally encompasses its main source of harvest (57.7% from *N California* in Fig. D-15), appears to be isolated from the rest of the Pacific Flyway. However, the apparent isolation or lack of similarity with other areas in harvest derivation (Fig. D-16) is influenced by California's coastal location.

Western Montana. – This area derives most of its harvest (57.5%) from the *Intermountain* area (Fig. D-17), of which Western Montana is a part. High similarity indices (Fig. D-18) with other States in the same reference area are to be expected.

Idaho. – *SW Alberta* and the *Intermountain* area were the most important sources of harvest in Idaho (33.8 and 32.3% respectively, Fig. D-19). Idaho is most similar in harvest derivation to areas from Alberta to Arizona, and Eastern Montana and Eastern Wyoming (Fig. D-20). The extremely low similarity index (13) between Idaho and Western Wyoming is believed to be a result of too few recoveries in the latter, geographically small, harvest area. For example, a single recovery from *N Saskatchewan–W Manitoba–W Ontario* accounted for 87.5% of the mallard harvest estimated for Western Wyoming.

Eastern Colorado. – The intensity of banding in the San Luis Valley of south-central Colorado overemphasized importance of the *High Plains* as a source of harvest for Eastern Colorado (81.9% in Fig. D-27), and underemphasized similarity in harvest derivation with other High Plains and Low Plains areas. Other areas similar in harvest derivation were Western Colorado and New Mexico (Fig. D-28). In their analysis of Valley-banded mallards, Hopper et al. (1975) showed that less than 10% of the direct recoveries and less than 20% of the indirect recoveries occurred outside of Colorado and New Mexico.

Western North Dakota, Eastern North Dakota, and Eastern South Dakota. – These harvest areas are discussed as a group because they shared common derivation characteristics. The three most important source areas were (1) *Missouri River Basin*, 37.1%, 30.4%, and 27.0%, respectively, for each harvest area; (2) *SW Saskatchewan*, 22.2%, 18.6%, and 22.3%; and (3) *N Alberta–N Northwest Territories*, 16.1%, 11.3%, and 13.1% (Figs. D-29, D-33, and D-35). Their sources of mallard harvest (similarity indices > 50) were also similar to Saskatchewan, the eastern tier States (generally both High and Low Plains portions) in the Central Flyway, and most of the Mississippi Flyway (Figs. D-30, D-34, and D-36).

Eastern Nebraska, Eastern Kansas, Eastern Oklahoma, and Eastern Texas. – These harvest areas, all of which are within the Low Plains, derive 29–38% of their mallard harvest from *SW Saskatchewan*, 16–18% from *SE Saskatchewan*, and 13–15% from *N Alberta–N Northwest Territories* (Figs. D-37, D-39, D-41, and D-43). Other areas with similar patterns of harvest derivation included Saskatchewan, Eastern Montana, the remaining eastern tier States (both High and Low Plains portions) of the Central Flyway, and most Mississippi Flyway States except for the northern tier (Figs. D-38, D-40, D-42, and D-44). This portion of the Low Plains is equally similar in harvest derivation to the western tier of Mississippi Flyway States and adjoining (High Plains) portions of these States.

Minnesota, Wisconsin, and Michigan. – These harvest areas are discussed together because (1) they receive less than about 15% (Figs. D-41, D-43, and D-45) of their total mallard harvest from the four southern Canadian reference areas (*SW Alberta*, *SW* and *SE Saskatchewan*, and *SW Manitoba*) and (2) each derives about 20% or more of its harvest from *N Saskatchewan–N Manitoba–W Ontario*. Similarity indices (Figs. D-46, D-48, and D-50) are also comparable and include a number of harvest areas in the Atlantic Flyway. The main source of mallards, however, is different for Minnesota (48.5% from the *Missouri River Basin*) compared to Wisconsin and Michigan (55.1% and 46.1% from the *Great Lakes*).

Iowa and Illinois. – Both of these areas derive almost 40% (Figs. D-51 and D-53) of their harvest from the four southern Canadian reference areas and about 25% from the *Missouri River Basin* and *Great Lakes* areas combined. *N Saskatchewan–N Manitoba–W Ontario* is also an important source of mallards and accounts for another 20% of the total mallard harvest in these areas. Their similarity in harvest derivation is further reflected by similarity indices (Figs. D-52 and D-54). Both areas have high indices with Saskatchewan and Manitoba, the Dakotas south to Texas, and States east to Georgia.

Missouri, Arkansas, Louisiana, and Mississippi. – There are similarities and differences in harvest derivation for these areas, although the differences are mostly gradual changes in derivation. All rely on the four southern Canadian reference areas for 50–61% (Figs. D-55, D-59, D-61, and D-63) of their total mallard harvest, 22–32% from *N Alberta–N Northwest Territories* and *N Saskatchewan–N Manitoba–W Ontario* combined, and 11–13% from the *Missouri River Basin*. Indices (Figs. D-56, D-60, D-62, and D-64) also suggest similarity in harvest derivation to Saskatchewan and Manitoba, eastern tier States (both High and Low Plains portions) of the Central Flyway, and most Mississippi Flyway States except the northern tier.

New York and Pennsylvania. – The importance of *E Ontario–W Quebec* to the total mallard harvest in these areas is about 37% (Figs. D-65 and D-67). *N Saskatchewan–N Manitoba–W Ontario* is also an important source of mallards for these areas. New York derives more of its mallard harvest (14.2%) from the *NE United States* than does Pennsylvania (2.8%). The *Great Lakes* and *Mid-Atlantic* reference areas also differ in their importance as sources of mallards for New York and Pennsylvania.

South Carolina. – This harvest area is representative of the southeastern Atlantic Flyway in terms of magnitude and derivation of the mallard harvest. The total harvest in this area is derived mainly from the *Great Lakes* (28.9% in

Table 20. Percent derivation of the adult male mallard harvest in harvest areas within the United States and Canada from major reference areas (1961-75 hunting seasons combined).[a]

Harvest area of recovery	Major reference area of banding																	
	N PAC 1	N ALTA N NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16	Total	Imp
AK	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.4
BC	94.2	4.6	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	3.8
NWTM	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0
ALTA	0.0	40.9	40.2	15.1	0.0	0.0	3.4	0.0	0.1	0.0	0.3	0.0	0.0	0.0	0.0	0.0	100.0	4.2
SASK	0.0	11.8	0.6	49.9	25.3	2.1	9.0	0.0	0.0	0.0	0.0	1.0	0.4	0.0	0.0	0.0	100.0	5.8
MAN	0.0	2.8	0.0	1.5	1.9	33.6	55.0	0.0	0.0	0.0	0.0	0.0	5.2	0.0	0.0	0.0	100.0	3.9
ONT	0.0	0.0	0.0	0.2	0.7	1.2	16.2	71.1	0.0	0.0	0.0	0.1	3.9	5.3	0.3	1.0	100.0	4.0
QUE	0.0	0.0	3.7	0.0	0.0	0.0	0.0	94.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	100.0	0.7
N B	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0
WA	37.0	16.0	21.8	5.2	0.4	0.0	0.0	0.0	18.1	0.1	1.3	0.1	0.0	0.0	0.0	0.0	100.0	4.4
OR	26.0	17.6	14.9	7.6	0.0	0.0	0.0	0.0	25.9	4.3	3.7	0.0	0.0	0.0	0.0	0.0	100.0	2.3
ID	5.6	13.3	32.5	6.8	0.0	0.1	4.5	0.0	1.0	0.0	35.3	0.9	0.2	0.0	0.0	0.0	100.0	3.6
MT-W	0.0	11.0	25.3	9.7	0.0	0.0	0.0	0.0	0.3	0.0	51.2	2.2	0.3	0.0	0.0	0.0	100.0	1.6
WY-W	0.0	0.0	0.0	0.0	0.0	0.0	89.5	0.0	0.0	0.0	10.5	0.0	0.0	0.0	0.0	0.0	100.0	0.2
CA	0.0	7.2	5.7	1.1	1.4	0.2	0.0	0.0	12.0	69.5	2.7	0.0	0.2	0.0	0.0	0.0	100.0	2.5
NV	0.0	0.0	20.9	0.0	0.0	0.0	0.0	0.0	2.9	0.0	72.9	3.4	0.0	0.0	0.0	0.0	100.0	0.2
UTAH	0.0	12.6	16.7	4.0	0.0	0.0	0.0	0.0	0.5	0.0	62.1	4.1	0.0	0.0	0.0	0.0	100.0	0.5
CO-W	0.0	0.0	4.5	11.2	0.0	0.0	0.0	0.0	0.0	0.0	6.6	77.7	0.0	0.0	0.0	0.0	100.0	0.3
AZ	0.0	0.0	31.1	0.0	0.0	0.0	0.0	0.0	7.3	0.0	32.4	29.1	0.0	0.0	0.0	0.0	100.0	0.0
NM-W	0.0	0.0	0.0	14.2	0.0	0.0	0.0	0.0	6.9	0.0	0.0	78.9	0.0	0.0	0.0	0.0	100.0	0.1
MT-E	0.0	18.6	12.3	18.9	3.3	0.0	0.0	0.0	0.0	0.0	0.9	45.5	0.6	0.0	0.0	0.0	100.0	0.8
ND-W	0.0	12.3	0.0	11.1	5.7	5.0	0.0	0.0	0.0	0.0	0.0	3.2	62.3	0.5	0.0	0.0	100.0	0.9
ND-E	0.0	14.4	1.8	9.5	6.0	7.5	13.4	0.0	0.0	0.0	0.0	1.6	44.6	1.4	0.0	0.0	100.0	1.4
SD-W	0.0	23.8	0.0	40.6	8.0	2.5	0.0	0.0	0.0	0.0	0.0	15.3	9.8	0.0	0.0	0.0	100.0	0.3
SD-E	0.0	17.8	4.8	17.9	12.1	4.2	13.3	0.0	0.0	0.0	0.0	4.0	25.6	0.1	0.0	0.0	100.0	1.9
WY-E	0.0	0.0	46.7	19.9	0.0	1.3	0.0	0.0	0.0	0.0	2.1	30.0	0.0	0.0	0.0	0.0	100.0	0.4
NEB-W	0.0	27.5	27.8	22.8	0.8	0.4	0.0	0.0	0.0	0.0	1.2	16.2	3.5	0.0	0.0	0.0	100.0	1.6
NEB-E	0.0	16.7	10.4	23.2	15.8	2.5	16.8	0.0	0.0	0.0	0.2	5.7	8.8	0.0	0.0	0.0	100.0	2.1
CO-E	0.0	3.0	8.0	8.1	1.0	0.1	0.0	0.0	0.0	0.0	0.8	78.4	0.5	0.0	0.0	0.0	100.0	5.5
KS-W	0.0	60.1	6.7	17.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.4	0.0	0.0	0.0	0.0	100.0	0.2
KS-E	0.0	24.5	12.1	33.9	13.4	3.5	0.0	0.0	0.0	0.0	0.0	5.7	6.9	0.0	0.0	0.0	100.0	1.9
NM-E	0.0	0.0	22.7	3.2	0.0	0.0	17.5	0.0	0.0	0.0	0.9	54.8	0.8	0.0	0.0	0.0	100.0	0.5
OK-W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	100.0	0.0
OK-E	0.0	20.0	9.0	35.2	17.3	3.2	0.0	0.0	0.0	0.0	0.5	3.8	10.5	0.5	0.0	0.0	100.0	1.4
TX-W	0.0	14.6	20.0	23.7	0.0	3.3	0.0	0.0	0.0	0.0	3.0	31.2	4.2	0.0	0.0	0.0	100.0	0.3
TX-E	0.0	30.2	7.7	34.8	9.2	3.3	0.0	0.0	0.0	0.0	0.2	5.3	9.0	0.2	0.0	0.0	100.0	2.2
MN	0.0	7.8	0.0	8.2	8.5	6.1	25.1	0.0	0.0	0.0	0.2	0.2	37.9	6.0	0.0	0.0	100.0	3.1
WISC	0.0	1.7	0.0	3.4	1.4	5.1	28.5	0.2	0.0	0.0	0.0	0.0	11.9	47.7	0.0	0.0	100.0	3.0
MICH	0.0	5.0	0.0	2.4	2.3	1.9	40.5	7.0	0.0	0.0	0.0	0.0	7.6	33.1	0.2	0.1	100.0	2.0
IOWA	0.0	10.7	0.0	18.4	15.9	9.0	22.3	0.2	0.0	0.0	0.0	1.7	18.4	3.4	0.0	0.0	100.0	2.5
ILL	8.3	12.1	1.0	13.6	10.6	8.3	26.0	0.2	0.0	0.0	0.0	0.5	12.8	6.5	0.0	0.0	100.0	4.9
IND	0.0	4.6	0.0	3.2	6.2	5.9	36.0	2.6	0.0	0.0	0.0	0.0	21.0	20.0	0.2	0.0	100.0	0.5

Table 20. Continued.

Harvest area of recovery	N PAC 1	N ALTA N NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16	Total	Imp
	Major reference area of banding																	
OHIO	0.0	0.0	0.0	0.0	8.7	7.2	0.0	19.0	0.0	0.0	0.0	0.0	11.6	45.5	7.8	0.1	100.0	0.5
MO	6.5	15.3	3.0	27.8	9.8	6.8	17.1	0.0	0.0	0.0	0.0	1.5	11.1	1.2	0.0	0.0	100.0	3.2
KY	0.0	0.0	6.1	24.4	5.8	13.8	0.0	9.1	0.0	0.0	0.0	3.1	18.3	18.1	1.4	0.0	100.0	0.4
ARK	0.0	13.5	5.4	28.0	19.8	6.1	10.1	0.2	0.0	0.0	0.2	1.6	13.2	2.0	0.0	0.0	100.0	7.3
TENN	0.0	6.1	0.0	24.9	8.7	13.0	12.1	5.6	0.0	0.0	0.0	1.1	13.4	14.1	0.9	0.1	100.0	1.6
LA	0.0	11.7	4.5	37.9	21.1	7.1	0.0	0.1	0.0	0.0	0.0	3.6	12.7	1.3	0.0	0.0	100.0	3.7
MISS	0.0	9.2	0.0	24.3	24.2	11.5	9.2	1.9	0.0	0.0	0.2	1.1	14.5	3.7	0.1	0.0	100.0	2.1
ALAB	0.0	14.7	0.0	13.9	7.3	8.2	0.0	17.1	0.0	0.0	0.0	1.8	21.1	15.1	0.9	0.0	100.0	0.3
ME	0.0	0.0	0.0	0.0	0.0	0.0	0.0	61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39.0	100.0	0.0
VT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.6	100.0	0.0
N H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	100.0	0.0
MASS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	49.3	0.0	0.0	0.0	0.0	6.1	0.0	1.3	43.4	100.0	0.1
CT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	64.6	0.0	0.0	0.0	0.0	0.0	18.8	0.0	16.6	100.0	0.0
R I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	82.7	0.0	0.0	0.0	0.0	0.0	0.0	17.3	0.0	100.0	0.0
N Y	0.0	0.0	0.0	0.0	1.2	2.0	21.9	40.9	0.0	0.0	0.0	0.0	2.6	7.8	13.2	10.4	100.0	1.0
PA	0.0	0.0	0.0	2.1	0.0	1.9	33.6	30.1	0.0	0.0	0.0	0.0	3.4	9.9	16.6	2.4	100.0	0.9
W V	0.0	0.0	28.7	0.0	0.0	0.0	0.0	43.1	0.0	0.0	0.0	0.0	6.4	13.6	3.8	4.3	100.0	0.0
N J	0.0	0.0	0.0	0.0	0.0	6.8	0.0	58.5	0.0	0.0	0.0	0.0	6.2	7.4	8.3	12.9	100.0	0.3
DEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	70.5	0.0	0.0	0.0	0.0	7.0	6.2	9.9	6.4	100.0	0.2
MD	0.0	0.0	0.0	3.6	19.8	2.9	0.0	35.2	0.0	0.0	0.0	0.0	8.0	15.6	9.2	5.9	100.0	0.4
VA	0.0	0.0	0.0	2.5	3.6	2.7	31.8	29.9	0.0	0.0	0.0	0.0	8.4	15.1	4.5	1.5	100.0	0.7
N C	0.0	0.0	0.0	6.6	0.0	6.4	0.0	46.1	0.0	0.0	0.0	0.0	11.3	24.4	3.4	1.8	100.0	0.3
S C	0.0	0.0	0.0	5.8	9.1	4.9	0.0	23.5	0.0	0.0	0.0	1.2	22.7	27.5	4.5	0.7	100.0	0.6
GA	0.0	22.5	0.0	7.7	17.4	3.7	0.0	15.7	0.0	0.0	0.0	0.0	8.9	22.2	1.2	0.7	100.0	0.2
FL	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	24.4	53.7	5.5	6.4	100.0	0.0
ALL	7.1	11.7	7.8	15.8	7.9	4.7	11.6	5.8	1.8	1.8	2.9	6.9	8.6	4.7	0.5	0.4	100.0	100.0

[a]Harvest derivation was based on direct adult male recoveries that were each adjusted for reporting rate and then population-weighted. The relative contribution of each major reference area to the adult male harvest is shown by "ALL", and the importance of each harvest area to the adult male harvest is shown by "Imp".

Table 21. Percent derivation of the adult female mallard harvest in harvest areas within the United States and Canada from major reference areas (1961-75 hunting seasons combined).[a]

Harvest area of recovery	Major reference area of banding																	
	N PAC 1	N N 2 ALTA NWT	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16	Total	Imp
AK	89.3	0.0	0.0	0.0	0.0	2.6	0.0	0.0	2.2	0.0	0.0	4.0	1.9	0.0	0.0	0.0	100.0	0.2
BC	90.4	3.5	2.5	0.8	0.0	0.0	0.0	0.0	2.3	0.0	0.3	0.1	0.1	0.0	0.0	0.0	100.0	3.2
NWTM	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.1
ALTA	0.0	31.0	53.1	12.6	0.2	0.2	0.2	0.0	0.2	0.0	1.0	1.1	0.4	0.0	0.0	0.0	100.0	6.9
SASK	0.0	8.9	0.4	50.8	31.5	1.0	4.0	0.0	0.0	0.0	0.1	1.3	1.8	0.2	0.0	0.0	100.0	7.0
MAN	0.0	5.1	1.1	3.5	6.7	47.4	21.4	0.4	0.1	0.0	0.0	1.4	11.7	1.2	0.1	0.0	100.0	3.3
ONT	0.0	0.4	0.0	0.5	1.6	0.6	15.0	68.3	0.0	0.1	0.0	0.0	3.6	6.8	1.3	1.8	100.0	3.8
QUE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	91.6	0.0	0.0	0.0	0.0	0.0	0.9	1.2	6.3	100.0	0.4
N B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0
N S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	100.0	0.0
WA	33.7	28.9	17.8	4.4	0.0	0.0	0.0	0.0	13.3	0.4	1.2	0.1	0.1	0.0	0.0	0.0	100.0	6.8
OR	41.4	11.8	15.6	2.8	0.0	0.0	0.0	0.0	21.0	3.5	3.5	0.3	0.0	0.0	0.0	0.0	100.0	2.9
ID	9.8	12.2	33.3	8.0	0.4	0.0	0.0	0.0	1.2	0.1	32.9	2.0	0.1	0.0	0.0	0.0	100.0	3.6
MT-W	0.0	4.6	15.3	11.4	0.0	0.0	0.0	0.0	0.0	0.0	68.1	0.5	0.0	0.0	0.0	0.0	100.0	0.3
WY-W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0
CA	8.3	7.0	11.7	4.0	0.0	0.1	0.0	0.0	9.7	52.5	6.2	0.4	0.1	0.0	0.0	0.0	100.0	2.7
NV	0.0	6.1	10.0	7.3	0.0	0.0	0.0	0.0	3.5	2.1	71.0	0.0	0.0	0.0	0.0	0.0	100.0	0.4
UTAH	0.0	15.2	26.2	5.1	0.0	0.0	0.0	0.0	0.0	0.0	48.0	5.5	0.0	0.0	0.0	0.0	100.0	0.7
CO-W	0.0	0.0	0.0	14.2	22.2	0.0	0.0	0.0	0.0	0.0	9.9	53.7	0.0	0.0	0.0	0.0	100.0	0.1
AZ	0.0	0.0	0.0	13.9	0.0	0.0	0.0	0.0	0.0	0.0	57.5	28.5	0.0	0.0	0.0	0.0	100.0	0.1
NM-W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.3	86.7	0.0	0.0	0.0	0.0	100.0	0.0
MT-E	0.0	11.7	13.2	20.5	0.0	1.4	0.0	0.0	0.0	0.0	4.2	47.5	1.5	0.0	0.0	0.0	100.0	0.3
ND-W	0.0	18.5	0.0	23.2	5.0	2.2	7.3	0.4	0.0	0.0	0.0	3.4	39.2	0.8	0.0	0.0	100.0	1.0
ND-E	0.0	7.1	0.0	20.7	18.9	10.7	0.0	0.9	0.0	0.0	0.0	2.5	35.7	3.4	0.1	0.0	100.0	1.4
SD-W	0.0	0.0	15.5	13.7	47.3	1.0	0.0	0.0	0.0	0.0	0.0	9.2	13.3	0.0	0.0	0.0	100.0	0.2
SD-E	0.0	8.9	3.2	19.5	7.1	3.1	10.4	0.3	0.0	0.0	0.2	3.1	42.3	1.7	0.0	0.0	100.0	1.5
WY-E	0.0	8.2	36.5	6.4	3.4	0.0	0.0	0.0	0.4	0.0	34.1	10.1	1.0	0.0	0.0	0.0	100.0	1.2
NEB-W	0.0	19.6	30.0	22.8	2.9	0.5	0.0	0.0	0.0	0.0	1.6	19.9	2.5	0.0	0.0	0.0	100.0	0.9
NEB-E	0.0	19.7	4.3	25.6	21.9	3.7	8.4	0.1	0.0	0.0	0.0	5.4	10.5	0.4	0.0	0.0	100.0	1.2
CO-E	0.0	4.5	2.7	4.7	0.2	0.1	0.0	0.0	0.0	0.0	0.3	87.2	0.2	0.0	0.0	0.0	100.0	5.2
KS-W	0.0	18.5	19.8	41.1	0.0	4.7	0.0	0.0	0.0	0.0	0.0	10.2	5.8	0.0	0.0	0.0	100.0	0.1
KS-E	0.0	17.7	11.5	27.3	20.2	2.7	12.0	0.1	0.0	0.0	0.1	3.5	5.0	0.0	0.0	0.0	100.0	1.7
NM-E	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	97.1	0.0	0.0	0.0	0.0	100.0	0.3
OK-W	0.0	5.2	31.0	10.6	0.0	0.0	0.0	0.0	0.0	0.0	6.1	46.0	1.1	0.0	0.0	0.0	100.0	0.3
OK-E	0.0	12.7	15.7	39.5	18.2	3.4	0.0	0.0	0.0	0.0	0.1	1.6	8.8	0.0	0.0	0.0	100.0	1.4
TX-W	0.0	11.7	25.0	25.2	0.0	0.0	0.0	0.0	0.0	0.0	2.8	33.5	1.8	0.0	0.0	0.0	100.0	0.2
TX-E	0.0	16.3	9.8	38.3	12.6	2.0	7.3	0.0	0.0	0.0	0.5	4.3	8.6	0.3	0.0	0.0	100.0	2.4
MN	0.0	1.9	0.5	8.0	9.1	4.9	23.6	0.5	0.0	0.0	0.0	0.3	41.7	9.2	0.2	0.0	100.0	5.2
WISC	0.0	1.1	0.0	3.1	5.8	4.0	9.0	2.6	0.0	0.0	0.0	0.2	13.7	60.1	0.4	0.1	100.0	3.0
MICH	0.0	0.0	0.0	1.2	2.8	1.7	16.2	13.8	0.0	0.0	0.0	0.0	5.8	57.1	1.3	0.2	100.0	1.3
IOWA	3.5	13.3	2.0	22.0	14.9	4.8	16.2	0.2	0.0	0.0	0.1	1.0	18.6	3.5	0.0	0.0	100.0	2.4
ILL	0.0	5.5	1.0	15.9	10.1	8.1	26.8	0.5	0.0	0.0	0.1	0.0	20.3	11.7	0.1	0.0	100.0	2.8

Table 21. Continued.

Harvest area of recovery	Major reference area of banding: N PAC 1	N N ALTA NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16	Total	Imp
IND	0.0	0.0	6.8	2.1	20.8	5.5	22.5	6.9	0.0	0.0	0.0	0.8	11.1	22.8	0.6	0.2	100.0	0.4
OHIO	0.0	0.0	0.0	6.1	0.0	1.4	17.8	20.5	0.0	0.0	0.0	0.0	3.3	40.1	10.3	0.4	100.0	0.4
MO	0.0	19.0	9.4	18.5	13.7	6.0	19.1	0.2	0.0	0.0	0.1	1.2	11.3	1.3	0.0	0.0	100.0	3.1
KY	0.0	9.5	0.0	17.5	6.0	6.0	30.9	6.7	0.0	0.0	0.0	0.0	11.0	11.3	1.1	0.0	100.0	0.4
ARK	2.5	13.3	4.3	32.2	14.8	7.0	7.8	0.5	0.0	0.0	0.0	1.4	13.8	2.1	0.0	0.0	100.0	6.5
TENN	0.0	7.4	2.2	15.8	14.8	6.2	22.5	8.1	0.0	0.0	0.0	0.2	11.2	10.5	0.9	0.1	100.0	1.5
LA	0.0	16.5	2.6	32.4	18.9	5.0	9.3	0.4	0.0	0.0	0.0	2.2	10.6	1.9	0.0	0.0	100.0	5.5
MISS	0.0	8.4	1.4	25.5	14.0	8.8	18.1	2.4	0.0	0.0	0.0	0.8	14.1	6.2	0.1	0.0	100.0	1.7
ALAB	0.0	10.7	5.3	9.0	16.2	10.3	5.8	15.1	0.0	0.0	0.0	0.4	10.7	15.3	1.1	0.1	100.0	0.4
ME	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	100.0	0.0
VT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41.4	0.0	0.0	0.0	0.0	0.0	2.4	0.0	56.3	100.0	0.0
N H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	100.0	0.0
MASS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.6	0.0	0.0	0.0	0.0	0.0	1.3	2.3	79.8	100.0	0.0
CT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	65.0	0.0	0.0	0.0	0.0	15.6	2.7	2.3	14.4	100.0	0.0
R I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	73.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.9	100.0	0.0
N Y	0.0	0.0	0.0	1.4	0.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	1.7	4.4	26.3	16.3	100.0	0.6
PA	0.0	0.0	0.0	4.9	0.0	0.0	6.4	47.3	0.0	0.0	0.0	0.0	1.6	9.0	27.5	3.3	100.0	0.4
W V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39.9	0.0	0.0	0.0	0.0	39.0	18.6	2.5	0.0	100.0	0.0
N J	0.0	0.0	0.0	0.0	0.0	0.0	0.0	61.9	0.0	0.0	0.0	0.0	6.1	3.2	13.8	15.0	100.0	0.2
DEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	71.4	0.0	0.0	0.0	0.0	0.8	5.9	12.8	9.2	100.0	0.2
MD	0.0	0.0	0.0	0.0	0.0	2.5	5.9	51.9	0.0	0.0	0.0	0.0	3.2	12.4	16.7	7.4	100.0	0.2
VA	0.0	9.8	0.0	6.8	0.0	3.5	0.0	48.9	0.4	0.0	0.0	0.0	4.9	12.3	9.0	4.4	100.0	0.4
N C	0.0	0.0	0.0	0.0	0.0	0.0	26.5	39.4	0.0	0.0	0.0	3.0	3.2	17.5	7.2	3.1	100.0	0.3
S C	0.0	0.0	0.0	11.2	0.0	3.0	0.0	34.4	0.0	0.0	0.0	0.0	8.5	34.1	7.3	1.6	100.0	0.5
GA	0.0	0.0	0.0	6.8	0.0	3.5	54.8	14.1	0.0	0.0	0.0	0.0	6.4	12.3	1.4	0.7	100.0	0.3
FL	0.0	0.0	0.0	35.4	0.0	0.0	0.0	16.1	0.0	0.0	0.0	0.0	19.2	27.3	0.4	1.5	100.0	0.1
ALL	7.3	11.7	10.1	16.2	8.7	4.2	8.0	5.2	1.9	1.6	3.1	6.7	9.0	5.2	0.6	0.4	100.0	100.0

[a]Harvest derivation was based on direct and indirect adult, and indirect immature female recoveries that were each adjusted for band reporting rate and then population-weighted. The relative contribution of each major reference area to the adult female harvest is shown by "ALL", and the importance of each harvest area to the adult female harvest is shown by "Imp".

Table 22. Percent derivation of the immature mallard harvest in harvest areas within the United States and Canada from major reference areas (1961-75 hunting seasons combined).[a]

Harvest area of recovery	N PAC 1	N N ALTA NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16	Total	Imp
AK	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.1
BC	93.9	3.9	0.6	0.2	0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	5.5
NWTM	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.8
ALTA	1.1	35.3	49.8	13.7	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	100.0	10.8
SASK	0.0	6.1	0.2	51.2	36.2	1.1	4.7	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.0	0.0	100.0	10.0
MAN	0.0	0.7	0.0	0.9	0.6	50.9	31.9	0.0	0.0	0.0	0.0	0.1	14.9	0.0	0.0	0.0	100.0	4.9
ONT	0.0	0.0	0.0	0.6	0.4	0.2	23.7	66.8	0.0	0.0	0.0	0.0	1.5	4.6	0.8	1.4	100.0	5.2
QUE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	96.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	3.8	100.0	0.6
N B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	74.5	0.0	0.0	0.0	0.0	0.0	0.0	19.5	6.1	100.0	0.0
PEI	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0
N S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	86.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.1	100.0	0.0
WA	39.1	21.9	14.5	3.7	0.0	0.0	0.0	0.0	19.9	0.1	0.8	0.0	0.0	0.0	0.0	0.0	100.0	4.8
OR	20.6	18.6	12.4	1.2	0.0	0.0	0.0	0.0	38.0	6.0	2.9	0.1	0.0	0.0	0.0	0.0	100.0	2.5
ID	9.0	13.8	27.3	11.6	0.0	0.1	0.4	0.0	1.1	0.0	36.1	0.6	0.0	0.0	0.0	0.0	100.0	2.1
MT-W	0.0	11.2	28.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	58.9	0.6	0.0	0.0	0.0	0.0	100.0	1.3
WY-W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0
CA	15.4	5.8	10.3	2.6	0.0	0.0	0.0	0.0	3.5	59.7	2.7	0.1	0.0	0.0	0.0	0.0	100.0	3.3
NV	0.0	9.6	8.2	2.6	0.0	0.0	0.0	0.0	1.4	0.2	78.0	0.0	0.0	0.0	0.0	0.0	100.0	0.3
UTAH	0.0	6.6	5.6	2.7	0.0	0.0	0.0	0.0	0.0	0.0	81.7	3.1	0.3	0.0	0.0	0.0	100.0	0.6
CO-W	0.0	0.0	17.8	8.6	0.0	0.0	0.0	0.0	0.0	0.0	2.3	70.0	1.3	0.0	0.0	0.0	100.0	0.1
AZ	0.0	0.0	23.2	6.1	0.0	0.0	0.0	0.0	0.0	0.0	28.0	42.8	0.0	0.0	0.0	0.0	100.0	0.1
NM-W	0.0	46.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.5	0.0	0.0	0.0	0.0	100.0	0.0
MT-E	0.0	14.1	46.7	14.6	0.0	0.0	0.0	0.0	0.0	0.0	1.4	20.9	2.2	0.0	0.0	0.0	100.0	0.3
ND-W	0.0	22.1	2.4	12.5	10.9	6.6	7.9	0.0	0.0	0.0	0.0	3.5	34.0	0.1	0.0	0.0	100.0	0.7
ND-E	0.0	14.1	0.0	11.8	13.5	7.0	8.2	0.1	0.0	0.0	0.0	0.5	44.0	0.8	0.0	0.0	100.0	1.2
SD-W	0.0	18.7	0.0	42.5	17.7	0.0	3.4	0.0	0.0	0.0	0.7	14.4	2.2	0.3	0.0	0.0	100.0	0.2
SD-E	0.0	17.5	0.0	20.5	12.3	4.7	15.0	0.0	0.0	0.0	0.0	1.7	28.3	0.2	0.0	0.0	100.0	1.2
WY-E	0.0	19.9	41.9	16.2	0.0	0.0	0.0	0.0	0.8	0.0	9.8	7.3	4.1	0.0	0.0	0.0	100.0	0.1
NEB-W	0.0	6.2	15.7	38.8	16.1	1.3	0.0	0.0	0.0	0.0	1.6	19.3	1.1	0.0	0.0	0.0	100.0	0.3
NEB-E	0.0	14.3	10.5	40.7	16.0	3.7	1.3	0.0	0.0	0.0	0.4	2.7	10.4	0.1	0.0	0.0	100.0	0.9
CO-E	0.0	1.3	0.5	1.1	0.6	0.0	0.8	0.0	0.0	0.0	0.0	95.6	0.0	0.0	0.0	0.0	100.0	5.3
KS-W	0.0	31.0	23.6	22.9	15.3	0.0	0.0	0.0	0.0	0.0	0.0	7.2	0.0	0.0	0.0	0.0	100.0	0.1
KS-E	0.0	20.2	6.3	35.2	16.1	5.0	5.9	0.0	0.0	0.0	0.2	4.6	6.4	0.2	0.0	0.0	100.0	0.9
NM-E	0.0	0.0	0.0	9.8	0.0	0.0	0.0	0.0	0.0	0.0	1.2	89.0	0.0	0.0	0.0	0.0	100.0	0.2
OK-E	0.0	21.4	9.8	31.4	11.1	3.1	9.7	0.0	0.0	0.0	0.5	4.0	8.3	0.6	0.0	0.0	100.0	0.6
TX-W	0.0	9.8	22.1	20.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.9	1.3	0.0	0.0	0.0	100.0	0.1
TX-E	0.0	8.6	7.7	35.5	22.3	3.4	11.7	0.0	0.0	0.0	0.1	3.7	6.6	0.3	0.0	0.0	100.0	1.5
MN	0.0	0.9	0.0	0.9	0.9	2.5	22.3	0.0	0.0	0.0	0.0	0.1	64.7	7.6	0.0	0.0	100.0	6.6
WISC	0.0	0.8	0.0	0.3	0.5	1.4	18.3	0.4	0.0	0.0	0.1	0.0	8.6	69.6	0.0	0.0	100.0	3.5
MICH	0.0	0.0	0.0	0.7	3.3	0.9	16.3	11.2	0.0	0.0	0.0	0.0	4.2	62.9	0.4	0.1	100.0	1.3
IOWA	0.0	7.5	1.0	14.9	5.8	4.9	25.1	0.0	0.0	0.0	0.0	0.2	33.5	7.0	0.0	0.0	100.0	2.2
ILL	0.0	10.4	0.0	21.3	10.0	7.4	24.7	0.5	0.0	0.0	0.0	0.1	17.0	8.5	0.1	0.0	100.0	2.9

Table 22. Continued.

Harvest area of recovery	N PAC 1	N N ALTA NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16	Total	Imp
	Major reference area of banding																	
IND	0.0	0.0	0.0	5.8	0.0	5.6	16.4	9.3	0.0	0.0	0.0	0.0	23.2	38.0	1.7	0.0	100.0	0.2
OHIO	0.0	0.0	0.0	1.6	0.0	1.0	0.0	25.1	0.0	0.0	0.0	0.0	4.5	49.3	17.9	0.5	100.0	0.3
MO	0.0	15.8	1.5	27.2	15.2	6.7	18.5	0.1	0.0	0.0	0.0	1.1	12.5	1.5	0.0	0.0	100.0	2.3
KY	0.0	4.6	0.0	12.1	18.9	3.2	24.0	11.8	0.0	0.0	0.0	0.0	10.0	14.4	0.7	0.2	100.0	0.3
ARK	0.0	9.4	4.1	30.5	18.7	6.0	14.9	0.5	0.0	0.0	0.0	2.0	12.0	1.8	0.0	0.0	100.0	4.8
TENN	0.0	4.1	0.0	27.9	9.4	6.2	21.8	8.1	0.0	0.0	0.0	0.7	12.8	8.0	0.8	0.2	100.0	0.9
LA	0.0	12.6	8.8	33.6	18.4	5.6	8.7	0.4	0.0	0.0	0.1	1.4	9.1	1.1	0.0	0.0	100.0	3.9
MISS	0.0	9.3	5.9	30.1	9.3	7.2	17.5	2.0	0.0	0.0	0.0	1.5	13.2	3.8	0.1	0.0	100.0	1.3
ALAB	0.0	0.0	18.6	0.0	0.0	8.1	19.4	15.1	0.0	0.0	0.0	1.8	14.5	20.5	1.5	0.5	100.0	0.2
ME	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	83.6	100.0	0.0
VT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.2	0.0	0.0	0.0	0.0	0.0	1.6	1.2	71.0	100.0	0.1
N H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	61.1	100.0	0.0
MASS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	79.0	100.0	0.0
CT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.6	0.0	0.0	0.0	0.0	0.0	0.0	5.8	46.6	100.0	0.0
R I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	100.0	0.0
N Y	0.0	0.0	0.0	0.0	0.0	0.0	2.9	33.6	0.0	0.0	0.0	0.0	0.0	1.2	43.0	19.2	100.0	0.8
PA	0.0	0.0	0.0	0.0	0.0	0.0	5.9	44.8	0.0	0.0	0.0	0.0	5.8	10.6	30.3	2.6	100.0	0.2
W V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	49.6	0.0	0.0	0.0	0.0	0.0	42.7	4.2	3.5	100.0	0.0
N J	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.1	0.0	0.0	0.0	0.0	0.0	8.7	23.2	14.0	100.0	0.1
DEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	59.8	0.0	0.0	0.0	0.0	0.0	10.6	20.4	9.2	100.0	0.1
MD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	64.7	0.0	0.0	0.0	0.0	1.8	7.0	18.1	8.4	100.0	0.1
VA	0.0	0.0	0.0	0.0	9.4	5.6	23.0	32.0	0.0	0.0	0.0	0.0	6.6	11.8	7.9	3.6	100.0	0.2
N C	0.0	0.0	0.0	0.0	0.0	2.0	0.0	55.7	0.0	0.0	0.0	0.0	4.5	22.8	9.3	5.8	100.0	0.1
S C	0.0	0.0	0.0	4.0	21.5	3.0	2.9	27.2	0.0	0.0	0.0	0.0	11.5	23.1	4.7	2.1	100.0	0.3
GA	0.0	0.0	0.0	8.3	31.8	0.0	19.7	9.7	0.0	0.0	0.0	5.2	10.5	11.7	1.9	1.2	100.0	0.1
FL	0.0	0.0	0.0	0.0	0.0	22.7	0.0	30.4	0.0	0.0	0.0	0.0	17.1	23.0	4.6	2.1	100.0	0.0
ALL	8.4	11.1	9.2	14.8	7.8	4.4	9.8	5.3	2.1	2.1	2.6	6.1	9.9	5.2	0.6	0.4	100.0	100.0

[a] Harvest derivation was based on direct immature male and female recoveries that were each adjusted for band reporting rate and then population-weighted. The relative contribution of each major reference area to the immature harvest is shown by "ALL", and the importance of each harvest area to the immature harvest is shown by "Imp".

Table 23. Percent derivation of the total mallard harvest in harvest areas within the United States and Canada from major reference areas (1961-75 hunting seasons combined).[a]

Harvest area of recovery	Major reference area of banding																	
	N PAC 1	N N ALTA NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16	Total	Imp
AK	94.8	0.0	0.0	0.0	0.0	1.5	0.0	0.0	1.5	0.0	0.0	1.3	0.9	0.0	0.0	0.0	100.0	0.1
YUK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.9	44.1	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0
BC	91.3	4.7	1.5	0.3	0.0	0.0	0.0	0.0	1.9	0.1	0.1	0.0	0.1	0.0	0.0	0.0	100.0	3.2
NWTM	0.0	99.1	0.0	0.7	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.0	100.0	0.3
ALTA	2.9	31.4	47.3	13.2	0.9	0.2	0.9	0.0	0.3	0.1	1.0	1.2	0.6	0.1	0.0	0.0	100.0	6.8
SASK	0.0	10.0	1.4	47.9	28.9	1.9	5.6	0.2	0.0	0.0	0.1	1.5	2.2	0.4	0.0	0.0	100.0	7.6
MAN	0.0	3.3	1.0	4.4	4.8	40.4	29.7	0.5	0.0	0.0	0.0	0.6	13.3	1.7	0.1	0.0	100.0	3.6
ONT	0.0	0.3	0.0	0.7	1.2	0.7	22.1	63.0	0.0	0.0	0.0	0.0	3.0	6.5	1.1	1.4	100.0	3.6
QUE	0.0	0.0	0.8	0.0	0.0	0.3	0.8	92.6	0.0	0.0	0.0	0.0	0.2	0.5	0.6	4.2	100.0	0.4
N B	0.0	0.0	74.7	12.9	0.0	0.0	0.0	9.1	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.5	100.0	0.0
PEI	0.0	0.0	0.0	0.0	0.0	0.0	0.0	92.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	100.0	0.0
N S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.6	0.0	0.0	0.0	0.0	0.0	66.8	0.0	11.6	100.0	0.0
WA	36.3	23.1	19.6	4.2	0.0	0.0	0.0	0.0	14.6	0.2	1.5	0.3	0.1	0.0	0.0	0.0	100.0	5.5
OR	32.4	15.0	15.6	2.9	0.0	0.0	0.8	0.0	24.4	4.7	3.7	0.3	0.1	0.0	0.0	0.0	100.0	2.6
ID	6.8	13.3	32.8	9.3	0.9	0.1	0.8	0.0	1.3	0.2	32.3	2.0	0.2	0.0	0.0	0.0	100.0	3.1
MT-W	0.0	10.5	26.0	4.7	0.0	0.0	0.0	0.0	0.1	0.0	57.5	1.0	0.1	0.0	0.0	0.0	100.0	0.7
WY-W	0.0	0.0	0.0	0.0	0.0	0.0	87.5	0.0	0.0	0.0	12.5	0.0	0.0	0.0	0.0	0.0	100.0	0.0
CA	8.6	6.4	10.7	2.8	0.3	0.1	0.0	0.0	8.6	57.7	4.3	0.5	0.1	0.0	0.0	0.0	100.0	2.7
NV	0.0	7.0	12.7	4.7	0.0	0.0	0.0	0.0	3.5	1.2	69.2	1.5	0.2	0.0	0.0	0.0	100.0	0.3
UTAH	0.0	9.1	13.6	5.2	0.0	0.2	0.0	0.0	0.2	0.0	62.6	9.0	0.1	0.0	0.0	0.0	100.0	0.6
CO-W	0.0	0.0	9.0	10.9	5.6	0.0	0.0	0.0	0.0	0.0	5.6	68.4	0.5	0.0	0.0	0.0	100.0	0.1
AZ	0.0	0.0	22.3	9.3	0.0	0.0	0.0	0.0	0.9	0.0	30.5	37.0	0.0	0.0	0.0	0.0	100.0	0.1
NM-W	0.0	10.3	7.4	2.4	0.0	0.0	0.0	0.0	1.2	0.0	6.1	72.7	0.0	0.0	0.0	0.0	100.0	0.0
MT-E	0.0	17.9	29.1	16.6	3.9	0.4	0.7	0.1	0.0	0.0	1.9	27.6	1.6	0.3	0.0	0.0	100.0	0.6
ND-W	0.0	16.1	1.9	22.2	7.0	5.2	3.8	0.6	0.0	0.0	0.1	4.6	37.1	1.4	0.0	0.0	100.0	0.9
ND-E	6.1	11.3	1.7	18.6	10.2	7.3	7.9	0.9	0.0	0.0	0.1	1.9	30.4	3.4	0.2	0.0	100.0	1.6
SD-W	0.0	23.9	8.6	26.6	13.3	1.1	10.3	0.1	0.0	0.0	0.6	9.8	5.7	0.1	0.0	0.0	100.0	0.3
SD-E	0.0	13.1	4.3	22.3	12.6	3.6	11.6	0.4	0.0	0.0	0.3	3.5	27.0	1.2	0.1	0.0	100.0	1.6
WY-E	3.4	13.1	32.3	12.0	1.5	0.1	0.0	0.0	0.5	0.1	26.1	9.7	0.8	0.1	0.0	0.0	100.0	1.0
NEB-W	0.0	20.0	24.6	26.5	8.4	0.5	0.0	0.0	0.0	0.0	1.3	15.8	2.8	0.0	0.0	0.0	100.0	1.2
NEB-E	4.5	16.3	8.4	29.4	16.4	3.3	6.2	0.1	0.0	0.0	0.2	5.7	8.9	0.4	0.0	0.0	100.0	1.8
CO-E	0.0	5.1	5.0	5.5	1.0	0.1	0.6	0.0	0.0	0.0	0.4	81.9	0.4	0.0	0.0	0.0	100.0	5.5
KS-W	0.0	25.4	10.4	29.9	13.6	2.4	0.0	0.1	0.0	0.0	0.4	13.4	4.4	0.0	0.0	0.0	100.0	0.2
KS-E	0.0	18.0	11.6	33.0	17.5	3.6	4.7	0.1	0.0	0.0	0.1	4.8	6.4	0.2	0.0	0.0	100.0	1.7
NM-E	0.0	2.8	10.7	7.4	0.9	0.0	3.2	0.0	0.0	0.0	2.5	71.9	0.5	0.0	0.0	0.0	100.0	0.4
OK-W	0.0	9.8	16.3	11.5	5.2	0.9	0.0	0.0	0.0	0.0	5.9	48.9	1.3	0.2	0.0	0.0	100.0	0.2
OK-E	0.0	14.0	10.9	38.2	15.7	3.5	3.1	0.0	0.0	0.0	0.4	4.3	9.5	0.4	0.0	0.0	100.0	1.3
TX-W	0.0	13.8	19.7	24.4	2.3	1.2	0.0	0.0	0.0	0.0	1.3	35.1	2.3	0.0	0.0	0.0	100.0	0.3
TX-E	1.9	14.1	9.0	35.8	13.7	2.9	8.3	0.0	0.0	0.0	0.4	5.3	8.2	0.4	0.0	0.0	100.0	2.2
MN	0.0	3.8	0.2	6.6	5.6	4.0	21.4	0.8	0.0	0.0	0.1	0.4	48.8	8.1	0.2	0.0	100.0	4.5
WISC	0.0	2.0	0.1	2.7	3.7	3.2	19.3	1.6	0.0	0.0	0.1	0.2	11.5	55.1	0.3	0.1	100.0	2.7
MICH	0.0	1.2	0.4	2.1	3.0	1.8	27.2	10.9	0.0	0.0	0.0	0.0	6.3	46.1	0.7	0.2	100.0	1.3

Table 23. Continued.

Harvest area of recovery	N PAC 1	N N ALTA NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16	Total	Imp
	Major reference area of banding																	
IOWA	0.7	12.7	2.8	20.5	11.5	5.1	20.6	0.5	0.0	0.0	0.0	1.0	20.6	4.1	0.1	0.0	100.0	2.5
ILL	1.5	9.7	0.8	18.2	12.0	7.7	23.1	1.1	0.0	0.0	0.0	0.6	16.4	8.7	0.2	0.0	100.0	3.5
IND	0.0	4.0	1.5	6.5	8.1	5.3	30.1	5.1	0.0	0.0	0.0	0.2	15.8	22.5	0.8	0.1	100.0	0.4
OHIO	0.0	1.6	0.0	2.2	1.5	2.7	9.2	20.3	0.0	0.0	0.0	0.0	8.6	43.3	10.3	0.4	100.0	0.4
MO	0.9	15.5	5.1	27.2	13.3	6.1	16.7	0.3	0.0	0.0	0.1	1.6	11.8	1.4	0.0	0.0	100.0	3.0
KY	0.0	5.8	2.6	15.4	9.6	5.7	24.7	9.1	0.0	0.0	0.0	0.7	12.3	13.0	0.9	0.1	100.0	0.4
ARK	0.5	12.2	5.5	30.6	16.5	6.1	10.0	0.5	0.0	0.0	0.1	2.3	13.6	2.1	0.0	0.0	100.0	7.2
TENN	0.0	7.9	0.8	19.7	9.3	6.8	24.6	6.8	0.0	0.0	0.0	1.0	12.0	10.3	0.7	0.1	100.0	1.5
LA	0.0	14.5	5.7	32.2	18.1	5.5	8.7	0.4	0.0	0.0	0.1	2.1	10.9	1.6	0.0	0.0	100.0	4.9
MISS	0.0	10.4	2.4	28.6	11.7	7.5	19.3	2.0	0.0	0.0	0.1	1.2	12.3	4.3	0.1	0.0	100.0	2.1
ALAB	0.0	5.3	5.8	10.7	9.0	7.5	9.0	15.2	0.0	0.0	0.0	1.7	15.9	18.7	1.1	0.1	100.0	0.3
ME	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	70.6	100.0	0.0
VT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.7	0.0	0.0	0.0	0.0	0.0	3.0	0.9	62.4	100.0	0.0
N H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.6	0.0	0.0	0.0	0.0	0.0	11.9	0.0	68.5	100.0	0.0
MASS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41.2	0.0	0.0	0.0	0.0	3.4	0.4	2.1	53.0	100.0	0.0
CT	0.0	0.0	0.0	6.8	0.0	2.6	0.0	53.7	0.0	0.0	0.0	0.0	8.3	8.7	3.3	16.7	100.0	0.0
R I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.9	0.0	0.0	0.0	0.0	0.0	0.0	5.2	40.0	100.0	0.0
N Y	0.0	0.0	0.0	0.6	0.2	0.5	13.8	38.4	0.0	0.0	0.0	0.0	1.3	4.0	26.9	14.2	100.0	0.7
PA	0.0	0.0	0.0	2.0	0.0	1.7	22.8	36.0	0.0	0.0	0.0	0.0	3.8	12.2	18.8	2.8	100.0	0.5
W V	0.0	0.0	3.6	0.0	0.0	0.0	45.2	21.0	0.0	0.0	0.0	0.0	7.9	18.2	2.5	1.5	100.0	0.0
N J	0.0	0.0	0.0	0.0	0.0	1.4	0.0	57.1	0.0	0.0	0.0	0.0	4.0	11.6	13.5	12.4	100.0	0.2
DEL	0.0	0.0	0.0	4.8	2.8	0.0	7.1	52.7	0.2	0.0	0.0	0.0	4.2	11.1	11.2	6.0	100.0	0.2
MD	0.0	0.0	0.0	2.7	3.9	1.6	19.1	38.4	0.0	0.0	0.0	0.0	5.6	11.3	11.9	5.5	100.0	0.3
VA	0.0	4.0	0.0	3.4	3.9	3.5	12.3	35.0	0.1	0.0	0.0	0.0	8.7	18.2	7.8	3.0	100.0	0.4
N C	0.0	0.0	0.0	1.1	0.6	2.1	9.8	45.1	0.0	0.0	0.0	0.8	7.0	23.6	6.6	3.2	100.0	0.2
S C	0.0	0.0	0.7	7.1	6.1	2.9	10.6	24.4	0.0	0.0	0.1	0.7	12.7	28.9	4.6	1.2	100.0	0.5
GA	0.0	7.3	0.0	9.7	9.1	4.0	25.2	14.7	0.0	0.0	0.0	1.0	8.7	17.9	1.6	0.8	100.0	0.2
FL	0.0	8.5	0.0	10.0	0.0	10.8	0.0	19.5	0.0	0.0	0.0	0.0	19.4	26.3	3.4	2.2	100.0	0.0
ALL	6.9	11.8	9.6	17.1	8.5	4.1	9.6	4.6	1.8	1.7	2.8	6.9	9.1	4.7	0.6	0.3	100.0	100.0

[a]Harvest derivation was based on direct and indirect recoveries of all age and sex classes, except locals, that were each adjusted for band reporting rate and then population-weighted. The relative contribution of each major reference area to the total harvest is shown by "ALL", and the importance of each harvest area to the total harvest is shown by "Imp".

Fig. D-69), *E Ontario–W Quebec* (24.4%), the *Missouri River Basin* (12.7%), and *N Saskatchewan–N Manitoba–W Ontario* (10.6%). This area is similar (Fig. D-70) to most Mississippi Flyway States except the western tier (Minnesota to Louisiana), and to most areas in the Atlantic Flyway other than New York and New England.

Within-season Derivation of the Mallard Harvest

Weekly derivation of the total mallard harvest by harvest area is shown in Table E-2 for weeks that contributed 1% or more of the area's harvest. Corresponding dates of weekly periods, which begin on 1 September, are shown in the introduction to Appendix E. These data are presented primarily as reference material. They should be interpreted cautiously, because varying intensities (including lack) of banding in particular breeding reference areas, years, and varying season lengths could indicate a temporal change in harvest derivation that is unjustified. This caution is especially appropriate with respect to the *N Pacific*, *N Alberta–N Northwest Territories*, and *N Saskatchewan–N Manitoba–W Ontario* reference areas where banded samples have been small and variable during the 1961–75 period. The column labelled "Imp" shows percent distribution of harvest among weekly periods for the harvest area. Values in this column are affected by varying numbers of season-days among time periods over years. They indicate time periods during which hunting seasons were most often open and relative importance of the harvest among time periods. In the following discussion we identify apparent temporal changes in harvest derivation of mallards in selected areas.

Washington. — Weeks 6 (6–12 October) to 21 (19–25 January) were represented by 1% or more of the harvest. Percent distribution of the harvest ranged from 1.8% (Week 6) to 9.3% (Week 7). This suggests that Week 6 was a period of small harvest and also that the seasons frequently began early in Week 7 (13–19 October), because large harvest values are associated with opening days. Regulation records show that the season opened late in Week 6 (earliest date 10 October) in 7 of the 15 years and in the early or middle part of Week 7 in 8 of the 15 years (see Table A-2 in Martin and Carney 1977). Mallards from *Washington–Oregon* contributed more than one-fourth but less than one-half of the harvest for Weeks 6 through 8 (6–26 October). For Weeks 10 (3–9 November) through 21 (19–25 January) more than four-fifths of the harvest was derived from Canadian reference areas.

Oregon. — For Weeks 6 through 9 (6 October–2 November) locally derived mallards (*Washington–Oregon* and *N California*) comprised a minimum of three-fourths of the harvest. For Weeks 11 (10–16 November) through 21 (19–25 January) the maximum contribution from these local areas was less than one-third of the harvest, and derivation from Canada clearly surpassed local derivation.

Idaho and Western Montana. — In both of these harvest areas derivation shifted from local to Canadian mallards at about the same time. During Weeks 6 through 10 (6 October–9 November) the average percent contribution from the *Intermountain* area to Idaho was 49%. For subsequent weeks (11–21) this average dropped to 27%. Comparable average percentages for Western Montana were 76% for the early (5–10) and 38% for the late (11–19) weeks.

California. — Particularly in the early weeks but throughout all weeks, locally derived mallards from *N California* and *Washington–Oregon* were most important in California's harvest. Their contribution to the harvest in California dropped below 50% in only one period (19).

Nevada and Utah. — The local *Intermountain* area appeared to be an important source of harvest for all weeks, although data for these States were somewhat erratic due to small numbers of recoveries. A shift toward more Canadian mallards after Week 7 (13–19 October) was indicated.

Eastern Montana. — Locally derived (*High Plains*) mallards comprised more than one-half of the harvest for Weeks 5 through 8 (29 September–26 October), but less than one-third during the remaining weeks.

Eastern Colorado. — Consistent opening season dates were indicated by the high importance (31.4%) of Week 5 (29 September–5 October). Local derivation comprised more than 95% of the harvest in Weeks 5 through 7 (29 September–19 October) and more than 50% of the harvest through Week 18 (29 December–4 January).

Eastern Dakotas. — In these areas, a moderate derivation shift was suggested from Weeks 8 to 9 (20 October–2 November), when locally derived (*Missouri River Basin*) mallards decreased in importance.

Nebraska, Kansas, Oklahoma, and Texas. — Both High and Low Plains portions of these States appeared to be consistent in source of harvest throughout the season. Percentage changes, which are believed to have resulted mainly from sampling variation, did not form a pattern. Relative consistency in harvest derivation appears to be affected by later opening season dates, by which time mallards from more areas are available.

Minnesota, Wisconsin, and Michigan. — These States appeared to harvest mainly locally derived birds for the first few weeks of their seasons. *Missouri River Basin* and *Great Lakes* mallards averaged over 60% of the harvest for Weeks 5 (29 September–5 October) through 9 (27 October–2 November) and less than 50% thereafter. Apparently, birds from more northern breeding areas are still north of these States when their hunting seasons open.

Iowa. — Temporal derivation was clearly different although the contributions of *SW Saskatchewan* (20.5% in Table 23) and the *Missouri River Basin* (20.6%) to the total Iowa mallard harvest were the same. The *Missouri River Basin* was the source of about 60% of Iowa's mallard harvest during Weeks 5 and 6 (29 September–12 October), a period during which birds from *SW Saskatchewan*

were apparently unavailable. This relationship, however, is complicated by the different hunting seasons (dates) that were selected in Iowa over the 15 years. Since all years were combined, it is impossible to demonstrate with certainty that early opening dates in Iowa impact *Missouri River Basin* mallards to a much greater extent than birds from other areas. The relatively low level of harvest during the early weeks must also be considered.

Illinois. — Derivation of the total mallard harvest in Illinois was very similar to that of Iowa from a season-long perspective. However, Illinois tended to select opening season dates that were 2–3 weeks later, which favored relative consistency in weekly harvest derivation. We interpret this as an indication that by Week 8 (20–26 October), mallards from many source areas were available to Illinois hunters.

Missouri, Arkansas, Louisiana, and Mississippi. — These harvest areas demonstrate remarkable consistency in weekly harvest derivation from major reference areas. Variations in percentages by time period, as in the southern Central Flyway, appeared to be rather small and more random than patterned.

Atlantic Flyway. — Recovery samples in the New England States were too small to demonstrate temporal changes in derivation even if such changes occurred. The larger samples available for New York, Pennsylvania, and South Carolina suggested consistency in seasonal derivation.

Harvest Derivation Implications

The principal purpose of this work has been to consolidate information on breeding–harvest area relationships. This information, pertaining only to mallards, may be of value in assessing flyway boundaries or proposed management units. However, other factors such as estimates of waterfowl harvest (see Martin and Carney 1977), recruitment and population size (see Pospahala et al. 1974), and survival and harvest rates (see Anderson 1975) must also be considered in a thorough assessment, which is beyond the scope of this study. Given these limitations, analyses of geographic and temporal derivation of the mallard harvest suggest a few management implications.

Although mallards and other waterfowl may migrate within corridors that are much narrower than flyways, these lanes of travel are shared by birds from a number of source areas. Bellrose and Crompton (1970:227), in their analysis of recovery distributions of mallards banded during the hunting season, stated that ". . . ducks migrate along definable areas of geography, which we have referred to as 'migration corridors' . . . ." They further suggest that, with more information, hunting regulations might be based upon migration corridors rather than flyways. Our results do not support the concept of management by migration corridors, assuming that identification of discrete source–harvest area populations is inherent in the concept. Simply stated, there are very few discrete source–harvest area relationships. Adjacent harvest areas in different flyways (e.g., Arkansas and Eastern Oklahoma) derive more than 80% of their total mallard harvest from the same reference areas. Many geographically separated harvest areas, regardless of flyway boundaries, derive more than 50% of their mallard harvest from the same source areas. Other examples further confirm that patterns of mallard movement from breeding to wintering areas are generally fan-shaped and overlapping.

Of the major flyway boundaries in the United States, only that between the Pacific and Central flyways appears reasonably intact. The remaining boundaries are transgressed by the dominant northwest–southeast movement of mallards from the important breeding areas in southern Canada and the northern United States. For example, mallards preseason-banded in Southern Saskatchewan have been recovered in all harvest areas of both High and Low Plains portions of the Central Flyway, all States in the Mississippi Flyway, and many southeastern States in the Atlantic Flyway.

Flyway boundaries are indistinct to mallards; therefore, it was not surprising to find general similarity in harvest derivation within and between High and Low Plains portions of the Central Flyway, and also the Low Plains and western tier States in the Mississippi Flyway. The High Plains Mallard Management Unit was justified on the basis of many factors (Funk et al. 1971), including recovery distributions from winter bandings, mortality and survival rate estimates, and relatively light hunting pressure. The *High Plains* reference area is the most important source of mallards for Eastern Colorado, Eastern New Mexico, and Western Oklahoma (Table 23). Although all remaining areas in the High Plains Unit derive much of their mallard harvest from the *High Plains* reference area, Canadian sources in combination are more important to their total harvest.

The Low Plains Unit was proposed mainly on the basis of survival rates and geographic and temporal distribution of recoveries from winter-banded mallards in the High Plains, Low Plains, and western tier States of the Mississippi Flyway (Hyland and Gabig 1980). Our results are in general agreement with those of Hyland and Gabig concerning mallards banded in the High Plains Unit. Few preseason- or winter-banded mallards from the High Plains are harvested in the Low Plains. However, both High and Low Plains portions of the Central Flyway other than North Dakota are very similar in combined harvest derivation from major reference areas in Canada. There is a gradual shift in importance of *SW Alberta* and *SW Saskatchewan* to the High Plains, and of *SW Saskatchewan* and *SE Saskatchewan* to the Low Plains.

Similarity continues when we compare harvest derivation in the Low Plains portion of the Central Flyway with that in the western tier States of the Mississippi Flyway except Minnesota. *SW Saskatchewan* and *SE Saskatchewan* are both important sources of mallards without regard to the flyway boundary.

The Mid-Continent Waterfowl Management Unit is another area under consideration (Office of Migratory Bird Management, personal communication). Approximated here by *SE Saskatchewan*, *SW Manitoba*, *Missouri River Basin*, and *Great Lakes* reference areas, this region has been characterized by declining quality and quantity of mallard breeding habitat, recruitment, and fall flights. Mallards from the western portion of the Mid-Continent Unit, according to our derivation analyses, are important in the Low Plains harvest. Harvest areas in the Low Plains derive from 25 (Eastern Texas) to 51% (Eastern North Dakota) of their total mallard harvest from the Mid-Continent Unit. Other than Western North Dakota, all harvest areas in the High Plains derive from 5 (Western Texas) to 20% (Western Kansas and Western South Dakota) of their total mallard harvest from the Mid-Continent Unit. The importance of the Mid-Continent Unit as a source of harvest is more apparent during the early portion of the hunting season in the northern portion of the Low Plains.

The Mid-Continent Unit is also an important source of mallards for the Mississippi Flyway, but particularly for the northern tier States. Like other northern harvest areas within the breeding range, locally derived mallards are usually the principal source of harvest. Although we found shifts in temporal (within-season) derivation of the mallard harvest in northern areas of the Pacific and Central flyways, the shifts within Minnesota, Wisconsin, and Michigan are more pronounced. A delay of perhaps a week in the opening of hunting seasons in these areas may buffer resident populations with additional birds migrating in from other areas, although the level of benefit is questionable (Cowardin and Johnson 1979).

Although existing flyway boundaries may not be optimally oriented for the management of mallard populations, the boundaries encompass areas that are geographically and appropriately large when the many similarities in harvest derivation are considered. We are consequently unable to describe previously unknown mallard subpopulations in geographic terms. We suggest, therefore, that future breeding–harvest area investigations include a greater emphasis on temporal or seasonal relationships.

Summary

This is the seventh in a series of reports on the population ecology of the mallard, the waterfowl species for which we have accumulated the most data. Results presented herein are based on (1) preseason bandings (1961–75) in major breeding ground reference areas, and subsequent recoveries of these birds in the United States and Canada, (2) May breeding ground surveys, (3) waterfowl harvest surveys, (4) mallard band reporting rate adjustments, and (5) results of previous reports in this series.

The major objectives of this report were to (1) estimate preseason age and sex structure of the continental population, (2) compare recovery distributions from major breeding ground reference areas of all age–sex classes, (3) describe geographic distribution of the harvest among States and Provinces from major reference areas, and (4) describe geographic and seasonal derivation of the harvest within each State and Province from major reference areas.

Age ratios in the preseason population averaged 0.98 immatures per adult and ranged from 0.75 (1968 and 1972) to 1.44 (1969). Percent males among preseason adults varied from 54% (1962) to 63% (1967 and 1969); the sex ratio averaged 1.42 males per female. Among young birds, the preseason sex ratio averaged 1.01 males per female.

Direct recovery distributions of immatures and females, perhaps due to their greater vulnerability to shooting or their longer association (greater availability) with breeding areas or both, were usually centered farther north than those of adult males. Direct recovery distributions, which included higher proportions of recoveries near banding sites, generally were centered farther north than distributions of indirect recoveries. Indirect recovery distributions of immature males were affected by pair formation (during winter or while on spring migration) with females destined for mid-continent breeding areas.

Analysis of recovery distributions led to the following combinations of banding or recovery-types or both to best describe distribution and derivation of the mallard harvest: (1) direct recoveries of adult males; (2) direct and indirect recoveries of adult females, and indirect recoveries of immature females; (3) direct recoveries of males and females that were banded as immatures; and (4) total mallards (combined direct and indirect recoveries of all age–sex classes, except locals).

Analysis of recovery-date distributions indicated substantial effects of age at banding, sex, and, to a lesser extent, time since banding on date of recovery within hunting seasons. The time difference suggested that survival or recovery rates might also vary as a function of years after banding. We therefore investigated what effect this variation would have on survival and recovery rate estimates. We concluded (1) survival rates that changed with years after banding would usually be detected (and rejected by the goodness-of-fit test); (2) similar changes in recovery rates, although essentially undetectable, would have to be unusually large to bias survival rate estimates; and (3) differences in dates of recovery generally parallel differences in geographic distribution.

Distribution of the harvest from major breeding reference areas is presented. The mallard harvest from *N Alberta–N Northwest Territories*, based on total recoveries that were each adjusted for reporting rate, was equally divided between Canada and each of the U.S. flyways except for the Atlantic. *SW Alberta* mallards were prevalent in Canada (31%) and the Pacific (33%) and Central (25%) flyways. Mallards from *SW* and *SE Saskatchewan* were mainly distributed in Canada (26%), the Central (27–22%), and Mississippi (42–50%) flyways, whereas birds from *SW Mani-*

toba were more restricted to Canada (39%) and the Mississippi Flyway (47%). Sixty-one percent of the total harvest from *N Saskatchewan-N Manitoba – W Ontario* was associated with areas in the Mississippi Flyway, whereas an equal percentage (61%) of the *E Ontario–W Quebec* harvest occurred in Canada. Most of the mallards harvested from the *Washington–Oregon* (95%), *N California* (99%), and *Intermountain* (83%) areas were associated with the Pacific Flyway. Most *High Plains* mallards (79%) remained in the *High Plains* portion of the Central Flyway. Sixty-seven percent of *Missouri River Basin* and 83% of *Great Lakes* mallards were associated with the Mississippi Flyway. About 75% of the mallards from the *Mid-Atlantic* and *NE United States* areas remained within the Atlantic Flyway.

Distribution of the total mallard harvest among flyways is compared to that estimated by the harvest survey with the following results: (1) Pacific Flyway, 21% (banding data) and 28% (harvest survey); (2) Central Flyway, 28% and 21%; (3) Mississippi Flyway, 46% and 43%, and (4) Atlantic Flyway, 4.5% and 7.4%. Our results tend to overestimate the harvest in areas of high banding intensity, such as the San Luis Valley of south-central Colorado, although lack of banded birds in important source areas is also a problem.

For each harvest area (State and Province) the derivation of harvest from major reference areas is tabulated. Harvest derivation is illustrated for areas that accounted for 0.5% or more of the total mallard harvest. Mallard harvest derivation similarity index maps are also presented for the same areas. We do not summarize harvest derivation, due to the number of harvest areas and the many similarities and differences encountered. However, we point out the extensive overlap and similarity in harvest derivation within and between High and Low Plains portions of the Central Flyway, and also the Low Plains and the western tier of Mississippi Flyway States (Minnesota to Louisiana). Geographically separate harvest areas may derive much of their harvest from common source areas, because recovery distributions are generally fan-shaped and overlap with those from adjacent source areas. Our results do not support the concept of management by migration corridors. The northwest–southeast movement of mallards from important interior breeding areas in the United States and Canada is not consistent with flyway boundaries.

There is little doubt that most mallards preseason-banded in the *High Plains* reference area remain within the High Plains Mallard Management Unit. The High–Low Plains boundary (100th meridian in this report) is certainly appropriate with respect to birds banded in the Central Flyway. When viewed from the continental perspective, however, contributions of mallards from other breeding areas override distinction of this boundary. Mallards from the proposed Mid-Continent Waterfowl Management Unit are more important to the harvest in the Low Plains than in the High Plains.

Seasonal derivation of the mallard harvest is tabulated. Locally derived birds are important during early hunting season days to the mallard harvest in the northern United States. Substantial shifts in harvest derivation within this region occurred 1 or 2 weeks after season openings. In view of extensive geographic similarities in harvest distribution and derivation, both within and among existing management units, future efforts to refine the management of waterfowl resources should also consider the timing of movements within and among population segments.

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References

Anderson, D. R. 1975. Population ecology of the mallard: V. Temporal and geographic estimates of survival, recovery, and harvest rates. U.S. Fish Wildl. Serv., Resour. Publ. 125. 110 pp.

Anderson, D. R., and K. P. Burnham. 1976. Population ecology of the mallard: VI. The effect of exploitation on survival. U.S. Fish Wildl. Serv., Resour. Publ. 128. 66 pp.

Anderson, D. R., and C. J. Henny. 1972. Population ecology of the mallard: I. A review of previous studies and the distribu-

tion and migration from breeding areas. U.S. Fish Wildl. Serv., Resour. Publ. 105. 166 pp.

Anderson, D. R., P. A. Skaptason, K. G. Fahey, and C. J. Henny. 1974. Population ecology of the mallard: III. Bibliography of published research and management findings. U.S. Fish Wildl. Serv., Resour. Publ. 119. 46 pp.

Batschelet, E. 1972. Recent statistical methods for orientation data. Pages 61–91 *in* S. R. Galler, K. Schmidt-Koenig, G. J. Jacobs, and R. E. Belleville, eds. Animal Orientation and Navigation, NASA SP-262. National Aeronautics and Space Administration, Washington, D.C. 606 pp.

Bellrose, F. C., Jr., and R. D. Crompton. 1970. Migrational behavior of mallards and black ducks as determined from banding. Ill. Nat. Hist. Surv. Bull. 30:167–234.

Bellrose, F. C., Jr., T. G. Scott, A. S. Hawkins, and J. B. Low. 1961. Sex ratios and age ratios in North American ducks. Ill. Nat. Hist. Surv. Bull. 27:391–474.

Botkin, D. B., and R. S. Miller. 1974. Mortality rates and survival of birds. Am. Nat. 108:181–192.

Bowers, E. F., and R. B. Hamilton. 1978. Derivation of northern wood ducks harvested in southern states of the Mississippi Flyway. Proc. Annu. Conf. Southeast. Assoc. Fish Wildl. Agencies 31:90–98.

Bowers, E. F., and F. W. Martin. 1975. Managing wood ducks by population units. Trans. N. Am. Wildl. Nat. Resour. Conf. 40:300–324.

Brownie, C., D. R. Anderson, K. P. Burnham, and D. S. Robson. 1978. Statistical inference from band recovery data: A handbook. U.S. Fish Wildl. Serv., Resour. Publ. 131. 212 pp.

Carney, S. M., M. F. Sorensen, and E. M. Martin. 1978. Average harvest of each duck species in states and counties during 1966–75 hunting seasons. U.S. Fish Wildl. Serv., Admin. Rep. 99 pp.

Conroy, M. J., and B. K. Williams. 1981. Sensitivity of band reporting-rate estimates to violations of assumptions. J. Wildl. Manage. 45:789–792.

Cowardin, L. M., and D. H. Johnson. 1979. Mathematics and mallard management. J. Wildl. Manage. 43:18–35.

Crissey, W. F. 1955. The use of banding data in determining waterfowl migration and distribution. J. Wildl. Manage. 19:75–84.

Crissey, W. F. 1957. Forecasting waterfowl harvest by flyways. Trans. N. Am. Wildl. Nat. Resour. Conf. 22:256–268.

Diem, K. L., and K. H. Lu. 1960. Factors influencing waterfowl censuses in the parklands, Alberta, Canada. J. Wildl. Manage. 24:113–133.

Funk, H. D., J. R. Grieb, D. Witt, G. F. Wrakestraw, G. W. Merrill, T. Kuck, D. Timm, T. Logan, and C. D. Stutzenbaker. 1971. Justification of the Central Flyway High Plains Mallard Management Unit. Central Flyway Technical Committee Report. 48 pp. (mimeo)

Geis, A. D. 1971. Breeding and wintering areas of mallards harvested in various states and provinces. U.S. Fish Wildl. Serv., Spec. Sci. Rep.—Wildl. 144. 59 pp.

Geis, A. D. 1972. Use of banding data in migratory game bird research and management. U.S. Fish Wildl. Serv., Spec. Sci. Rep.—Wildl. 154. 47 pp.

Geis, A. D. 1974. Breeding and wintering areas of canvasbacks harvested in various states and provinces. U.S. Fish Wildl. Serv., Spec. Sci. Rep.—Wildl. 185. 78 pp.

Geis, A. D., R. I. Smith, and J. P. Rogers. 1971. Black duck distribution, harvest characteristics, and survival. U.S. Fish Wildl. Serv., Spec. Sci. Rep.—Wildl. 139. 241 pp.

Henny, C. J., and K. P. Burnham. 1976. A reward band study of mallards to estimate band reporting rates. J. Wildl. Manage. 40:1–14.

Hopper, R. M., H. D. Funk, and D. R. Anderson. 1978. Age specificity in mallards banded postseason in eastern Colorado. J. Wildl. Manage. 42:263–270.

Hopper, R. M., A. D. Geis, J. R. Grieb, and L. Nelson, Jr. 1975. Experimental duck hunting seasons, San Luis Valley, Colorado, 1963–1970. Wildl. Monogr. 46. 68 pp.

Hyland, J. M., and P. J. Gabig. 1980. Survival and recovery distribution of central and western Mississippi Flyway winter-banded mallards. Nebr. Tech. Ser. 6. 132 pp.

Jessen, R. L. 1970. Mallard population trends and hunting losses in Minnesota. J. Wildl. Manage. 34:93–104.

Johnson, D. H., and A. B. Sargeant. 1977. Impact of red fox predation on the sex ratio of prairie mallards. U.S. Fish Wildl. Serv., Wildl. Res. Rep. 6. 56 pp.

Kleinbaum, D. G., and L. L. Kupper. 1978. Applied regression analysis and other multivariate methods. Duxbury Press, N. Situate, Mass. 556 pp.

Lebret, T. 1950. The sex-ratios and the proportion of adult drakes of teal, pintail, shoveler and wigeon in the Netherlands, based on field counts made during autumn, winter and spring. Ardea 38:1–18.

Lensink, C. J. 1964. Distribution of recoveries from bandings of ducklings. U.S. Fish Wildl. Serv., Spec. Sci. Rep.—Wildl. 89. 146 pp.

Leslie, P. H. 1945. On the use of matrices in certain population mathematics. Biometrika 33:183–212.

Leslie, P. H. 1948. Some further notes on the use of matrices in population mathematics. Biometrika 35:213–245.

March, J. R., and R. A. Hunt. 1978. Mallard population and harvest dynamics in Wisconsin. Wisconsin Dep. Nat. Resour. Tech. Bull. 106. 74 pp.

Mardia, K. V. 1967. A non-parametric test for the bivariate two-sample location problem. J. R. Stat. Soc., Ser. B, 29:320–342.

Mardia, K. V. 1969*a*. On Wheeler and Watson's two-sample test on a circle. Sankhya, Ser. A, 31:177–190.

Mardia, K. V. 1969*b*. On the null distribution of a non-parametric test for the bivariate two-sample problem. J. R. Stat. Soc., Ser. B, 31:98–102.

Mardia, K. V. 1972. Statistics of directional data. Academic Press, London. 357 pp.

Martin, E. M., and S. M. Carney. 1977. Population ecology of the mallard: IV. A review of duck hunting regulations, activity, and success, with special reference to the mallard. U.S. Fish Wildl. Serv., Resour. Publ. 130. 137 pp.

Martin, F. W., R. S. Pospahala, and J. D. Nichols. 1979. Assessment and population management of North American migratory birds. Pages 187–239 *in* J. Cairns, G. P. Patil, and W. E. Waters, eds. Environmental biomonitoring, assessment, prediction and management—certain case studies and related quantitative issues. Statistical Ecology Ser. Vol. II, International Cooperative Publishing House, Fairland, Md. 438 pp.

Martinson, R. K., and C. F. Kaczynski. 1967. Factors influencing waterfowl counts on aerial surveys, 1961–1966. U.S. Fish Wildl. Serv., Spec. Sci. Rep.—Wildl. 105. 78 pp.

Mathiasson, S. 1971. A study of a mallard population (*Anas platyrhynchos*) in the non-breeding season. Pages 13–36 *in* Annual Report of the Goteborgs Naturhistoriska Museum. Goteborgs, Sweden.

Ogilvie, M. A., and W. A. Cook. 1971. Differential migration of the sexes and other aspects of the recovery overseas of mallard ringed at Borough Fen Decoy, Northhamptonshire. Wildfowl 22:89–97.

Pospahala, R. S., D. R. Anderson, and C. J. Henny. 1974. Population ecology of the mallard: II. Breeding habitat conditions, size of the breeding populations, and production indices. U.S. Fish Wildl. Serv., Resour. Publ. 115. 73 pp.

Robson, D. S. 1968. The effect of ties on critical values of some two-sample rank tests. Biometrics Unit, Cornell Univ., Ithaca, New York, BU-258-M. 4 pp. (mimeo)

Sokal, R. R., and F. J. Rohlf. 1969. Biometry. W. H. Freeman and Company, San Francisco, Calif. 776 pp.

Sowls, L. K. 1955. Prairie ducks: a study of their behavior, ecol-

ogy and management. The Stackpole Co., Harrisburg, Pennsylvania, and Wildlife Management Institute. 193 pp.
Stewart, R. E., A. D. Geis, and C. D. Evans. 1958. Distribution of populations and hunting kill of the canvasback. J. Wildl. Manage. 22:333–370.
Wheeler, S., and G. S. Watson. 1964. A distribution-free two-sample test on a circle. Biometrika 51:256–257.
Wight, H. M., R. G. Heath, and A. D. Geis. 1965. A method for estimating fall adult sex ratios from production and survival data. J. Wildl. Manage. 29:185–192.

Appendix A

Mallard Breeding Population Indices, Population Weights, and Band Reporting Rate Adjustments

Table A-1. Mallard breeding population indices in major reference areas for the years 1961-75.[a]

	Major reference area breeding populations (thousands)															
Year	N PAC 1	N ALTA N NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16
1961	762.2	2536.7	823.3	1474.1	765.2	358.8	566.1	300.0	120.0	119.3	256.7	587.0	567.8	323.5	39.6	23.6
1962	534.3	1289.0	611.1	976.5	580.5	246.8	722.0	300.0	120.0	119.3	256.7	624.3	723.2	310.8	39.6	23.6
1963	640.0	1362.4	715.6	1387.4	696.6	361.0	549.0	300.0	120.0	119.3	256.7	740.4	953.4	311.7	39.6	23.6
1964	445.9	1485.2	712.7	1118.8	736.9	447.8	678.6	300.0	120.0	119.3	256.7	613.0	735.5	315.9	39.6	23.6
1965	575.4	846.7	563.7	921.5	583.5	342.1	701.6	300.0	120.0	119.3	269.3	745.8	757.5	344.6	39.6	23.6
1966	456.4	913.6	1011.5	1794.9	770.3	355.4	572.2	300.0	120.0	119.3	340.6	802.3	726.0	326.0	39.6	23.6
1967	555.1	806.1	1047.8	1690.9	897.3	464.0	1352.3	300.0	120.0	119.3	279.8	809.4	712.0	345.3	39.6	23.6
1968	559.7	1065.1	606.7	1802.8	750.5	291.2	1185.1	300.0	120.0	119.3	212.8	632.1	789.4	313.1	39.6	23.6
1969	460.5	822.7	767.4	1757.2	916.4	480.1	1346.7	300.0	120.0	119.3	251.5	842.8	730.3	313.1	39.6	23.6
1970	639.6	1001.5	1030.6	2422.6	1235.7	560.0	1763.1	300.0	120.0	119.3	257.3	798.3	1009.0	313.1	39.6	23.6
1971	498.9	1069.6	1168.7	2986.8	1216.6	354.0	922.2	300.0	120.0	119.3	243.5	761.0	1015.2	313.1	39.6	23.6
1972	541.9	1654.1	1166.3	2128.1	1283.2	454.9	841.7	300.0	120.0	119.3	286.7	973.8	948.9	313.1	39.6	23.6
1973	517.6	1242.9	1121.0	2126.1	933.8	293.7	949.8	300.0	120.0	119.3	227.3	732.7	858.8	313.1	39.6	23.6
1974	543.1	1015.1	998.3	1884.9	833.4	346.1	638.0	300.0	120.0	119.3	198.6	493.7	637.1	313.1	39.6	23.6
1975	422.1	1085.4	871.3	1928.7	1111.2	382.8	712.5	300.0	120.0	119.3	260.7	860.1	682.9	313.1	39.6	23.6

[a] Data taken from Pospahala et al. (1974) and files, Office of Migratory Bird Management, Laurel, Maryland.

Table A-2. Suggested hunter band reporting rate adjustments for mallard recoveries during the years 1961-75.[a]

Year of recovery	Distances (km) and locations of recoveries								
	Manitoba eastward in Canada and Atlantic Flyway			Central and Mississippi Flyways			Saskatchewan westward in Canada and Pacific Flyway		
	0-8	9-79	80+	0-8	9-79	80+	0-8	9-79	80+
1961	3.09	2.75	2.11	3.19	2.36	1.84	3.19	2.11	1.63
1962	3.16	2.80	2.14	3.26	2.40	1.86	3.26	2.14	1.65
1963	3.23	2.86	2.17	3.33	2.44	1.89	3.33	2.17	1.67
1964	3.30	2.91	2.21	3.41	2.48	1.91	3.41	2.21	1.69
1965	3.37	2.97	2.24	3.49	2.52	1.94	3.49	2.24	1.70
1966	3.45	3.03	2.27	3.57	2.56	1.96	3.57	2.27	1.72
1967	3.53	3.09	2.31	3.66	2.61	1.99	3.66	2.31	1.74
1968	3.61	3.16	2.34	3.75	2.65	2.01	3.75	2.34	1.76
1969	3.70	3.23	2.38	3.85	2.70	2.04	3.85	2.38	1.79
1970	3.80	3.30	2.42	3.95	2.75	2.07	3.95	2.42	1.81
1971	3.90	3.37	2.46	4.05	2.80	2.10	4.05	2.46	1.83
1972	4.00	3.45	2.50	4.17	2.86	2.13	4.17	2.50	1.85
1973	4.11	3.53	2.54	4.29	2.91	2.16	4.29	2.54	1.87
1974	4.23	3.62	2.59	4.41	2.97	2.19	4.41	2.59	1.90
1975	4.35	3.71	2.63	4.55	3.03	2.22	4.55	2.63	1.92

[a]These estimates refer to who reported code "21" only. All others are assumed to be reported at a 100% rate. Data through 1972 taken from Henny and Burnham (1976:11); adjustments for subsequent years were extrapolated from their results.

Table A-3. Mallard population weights by major reference area for the years 1961-75.[a]

Year and age-sex	N PAC 1	N ALTA N NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16
61 AM	18082.9	2126.8	1030.5	676.8	1061.3	234.7	8074.5	255.8	165.3	137.7	215.4	273.0	216.9	189.7	52.5	56.9
62 AM	17286.6	2033.2	985.2	647.0	1014.6	224.3	7718.9	244.6	158.0	131.6	205.9	261.0	207.4	181.4	50.2	54.4
63 AM	17801.4	2093.7	1014.5	666.3	1044.8	231.0	7948.8	251.8	162.7	135.5	212.1	268.7	213.6	186.8	51.7	56.0
64 AM	19938.8	2345.1	1136.3	746.3	1170.2	258.8	8903.1	282.1	182.2	151.8	237.5	301.0	239.2	209.2	57.9	62.8
65 AM	19061.3	2241.9	1086.3	713.4	1118.7	247.4	8511.3	269.7	174.2	145.1	227.1	287.7	228.7	200.0	55.3	60.0
66 AM	18164.8	2136.5	1035.2	679.9	1066.1	235.7	8111.0	257.0	166.0	138.3	216.4	274.2	217.9	190.6	52.7	57.2
67 AM	20123.7	2366.9	1146.8	753.2	1181.1	261.2	8985.7	284.7	183.9	153.2	239.7	303.8	241.4	211.1	58.4	63.3
68 AM	18856.8	2217.8	1074.6	705.8	1106.7	244.7	8420.0	266.8	172.3	143.6	224.7	284.7	226.2	197.8	54.7	59.4
69 AM	20082.0	2361.9	1144.5	751.6	1178.6	260.6	8967.1	284.1	183.5	152.9	239.2	303.1	240.9	210.7	58.3	63.2
70 AM	19166.2	2254.2	1092.3	717.3	1124.9	248.7	8558.2	271.1	175.2	145.9	228.3	289.3	229.9	201.1	55.6	60.3
71 AM	17502.9	2058.6	997.5	655.1	1027.3	227.1	7815.5	247.6	160.0	133.3	208.5	264.2	210.0	183.6	50.8	55.1
72 AM	19346.0	2275.4	1102.5	724.1	1135.4	251.1	8638.4	273.7	176.8	147.3	230.5	292.0	232.1	203.0	56.2	60.9
73 AM	18524.9	2178.8	1055.7	693.3	1087.2	240.4	8271.8	262.1	169.3	141.1	220.7	279.6	222.2	194.4	53.8	58.3
74 AM	19941.7	2345.4	1136.5	746.4	1170.4	258.8	8904.4	282.1	182.3	151.8	237.6	301.0	239.2	209.2	57.9	62.8
75 AM	18750.2	2205.3	1068.6	701.8	1100.5	243.3	8372.4	265.3	171.4	142.8	223.4	283.0	224.9	196.7	54.4	59.0
61 AF	14125.5	2532.6	2388.4	1398.8	2184.1	376.4	6179.0	187.3	113.4	132.5	236.1	291.1	191.0	70.4	32.5	37.8
62 AF	14928.2	2676.5	2524.1	1478.3	2308.2	397.8	6530.1	197.9	119.9	140.1	249.5	307.7	201.8	74.4	34.4	39.9
63 AF	14409.2	2583.5	2436.4	1426.9	2228.0	384.0	6303.1	191.1	115.7	135.2	240.8	297.0	194.8	71.8	33.2	38.5
64 AF	12254.9	2197.2	2072.1	1213.5	1894.9	326.6	5360.7	162.5	98.4	115.0	204.8	252.6	165.7	61.1	28.2	32.8
65 AF	13139.4	2355.8	2221.7	1301.1	2031.6	350.2	5747.6	174.2	105.5	123.3	219.6	270.8	177.6	65.5	30.3	35.1
66 AF	14043.0	2517.8	2374.4	1390.6	2171.3	374.2	6142.9	186.2	112.8	131.8	234.7	289.4	189.8	70.0	32.3	37.6
67 AF	12068.6	2163.8	2040.6	1195.1	1866.1	321.6	5279.2	160.0	96.9	113.2	201.7	248.7	163.2	60.2	27.8	32.3
68 AF	13345.5	2392.8	2256.5	1321.5	2063.5	355.7	5837.8	177.0	107.2	125.2	223.0	275.0	180.4	66.5	30.7	35.7
69 AF	12110.6	2171.4	2047.7	1199.3	1872.6	322.8	5297.6	160.6	97.2	113.6	202.4	249.6	163.7	60.4	27.9	32.4
70 AF	13033.6	2336.8	2203.8	1290.7	2015.3	347.3	5701.4	172.8	104.7	122.3	217.8	268.6	176.2	65.0	30.0	34.9
71 AF	14710.1	2637.4	2487.2	1456.7	2274.5	392.0	6434.7	195.1	118.1	138.0	245.8	303.2	198.9	73.3	33.9	39.3
72 AF	12852.5	2304.4	2173.1	1272.7	1987.3	342.5	5622.1	170.4	103.2	120.6	214.8	264.9	173.8	64.1	29.6	34.4
73 AF	13680.0	2452.7	2313.1	1354.7	2115.2	364.6	5984.1	181.4	109.8	128.4	228.6	281.9	184.9	68.2	31.5	36.6
74 AF	12252.0	2196.7	2071.6	1213.3	1894.4	326.5	5359.5	162.5	98.4	115.0	204.8	252.5	165.6	61.1	28.2	32.8
75 AF	13452.9	2412.0	2274.7	1332.2	2080.1	358.5	5884.8	178.4	108.0	126.2	224.8	277.3	181.9	67.1	31.0	36.0
61 IM	9671.7	1382.2	1568.3	936.6	1830.1	245.2	1862.4	62.7	71.8	151.7	161.9	294.5	202.7	59.3	21.3	13.7
62 IM	13462.2	1923.9	2182.9	1303.7	2547.4	341.3	2592.3	87.2	100.0	211.1	225.3	410.0	282.1	82.6	29.6	19.0
63 IM	12122.1	1732.4	1965.6	1173.9	2293.8	307.3	2334.2	78.5	90.0	190.1	202.9	369.2	254.1	74.4	26.7	17.2
64 IM	9865.0	1409.8	1599.6	955.3	1866.7	250.1	1899.6	63.9	73.3	154.7	165.1	300.4	206.7	60.5	21.7	14.0
65 IM	15167.0	2167.6	2459.4	1468.8	2870.0	384.5	2920.5	98.3	112.7	237.8	253.8	461.9	317.9	93.0	33.3	21.5
66 IM	12411.4	1773.8	2012.5	1201.9	2348.5	314.7	2389.9	80.4	92.2	194.6	207.7	378.0	260.1	76.1	27.3	17.6
67 IM	11914.6	1702.8	1932.0	1153.8	2254.5	302.1	2294.3	77.2	88.5	186.8	199.4	362.8	249.7	73.1	26.2	16.9
68 IM	8694.0	1242.5	1409.8	841.9	1645.1	220.4	1674.1	56.3	64.6	136.3	145.5	264.8	182.2	53.3	19.1	12.3
69 IM	16791.1	2399.7	2722.7	1626.1	3177.3	425.7	3233.3	108.8	124.7	263.3	281.0	511.4	351.9	103.0	36.9	23.8
70 IM	10041.3	1435.0	1628.2	972.4	1900.0	254.6	1933.5	65.1	74.6	157.5	168.1	305.8	210.4	61.6	22.1	14.2

The table's spanning header over columns 1–16 reads "Major reference area population weights".

Table A-3. Continued.

Year and age-sex	N PAC 1	N ALTA N NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16
	Major reference area population weights															
71 IM	9852.0	1408.0	1597.5	954.1	1864.2	249.8	1897.1	63.8	73.2	154.5	164.9	300.0	206.5	60.4	21.7	13.9
72 IM	8691.0	1242.1	1409.3	841.6	1644.5	220.4	1673.5	56.3	64.6	136.3	145.5	264.7	182.1	53.3	19.1	12.3
73 IM	9945.1	1421.3	1612.6	963.1	1881.8	252.1	1915.0	64.4	73.9	156.0	166.4	302.9	208.4	61.0	21.9	14.1
74 IM	14628.7	2090.7	2372.1	1416.7	2768.1	370.9	2816.9	94.8	108.7	229.4	244.8	445.5	306.6	89.7	32.2	20.7
75 IM	11099.5	1586.3	1799.8	1074.9	2100.3	281.4	2137.3	71.9	82.4	174.1	185.8	338.0	232.6	68.1	24.4	15.7
61 IF	7472.6	1541.6	1983.9	1094.6	2175.9	297.8	1957.3	77.9	82.2	271.6	224.6	355.8	229.6	52.7	22.4	13.7
62 IF	10401.3	2145.7	2761.4	1523.6	3028.7	414.5	2724.4	108.4	114.5	378.0	312.6	495.2	319.5	73.4	31.1	19.0
63 IF	9365.9	1932.1	2486.5	1371.9	2727.3	373.3	2453.2	97.6	103.1	340.4	281.4	445.9	287.7	66.1	28.0	17.1
64 IF	7622.0	1572.4	2023.5	1116.4	2219.4	303.8	1996.4	79.4	83.9	277.0	229.0	362.9	234.2	53.8	22.8	13.9
65 IF	11718.5	2417.5	3111.1	1716.5	3412.3	467.0	3069.4	122.1	129.0	425.9	352.1	557.9	360.0	82.7	35.1	21.4
66 IF	9589.4	1978.3	2545.9	1404.6	2792.3	382.2	2511.8	99.9	105.5	348.5	288.2	456.6	294.6	67.7	28.7	17.5
67 IF	9205.5	1899.1	2444.0	1348.4	2680.6	366.9	2411.2	95.9	101.3	334.6	276.6	438.3	282.8	65.0	27.5	16.8
68 IF	6717.2	1385.7	1783.3	983.9	1956.0	267.7	1759.5	70.0	73.9	244.1	201.9	319.8	206.4	47.4	20.1	12.3
69 IF	12973.2	2676.3	3444.2	1900.3	3777.7	517.0	3398.1	135.2	142.8	471.5	389.8	617.7	398.6	91.6	38.8	23.7
70 IF	7758.2	1600.5	2059.7	1136.4	2259.1	309.2	2032.1	80.8	85.4	282.0	233.1	369.4	238.3	54.8	23.2	14.2
71 IF	7611.9	1570.3	2020.9	1115.0	2216.5	303.4	1993.8	79.3	83.8	276.6	228.7	362.4	233.8	53.7	22.8	13.9
72 IF	6714.9	1385.3	1782.7	983.6	1955.3	267.6	1758.8	70.0	73.9	244.0	201.8	319.7	206.3	47.4	20.1	12.3
73 IF	7683.9	1585.2	2040.0	1125.5	2237.5	306.2	2012.6	80.1	84.6	279.2	230.9	365.8	236.1	54.2	23.0	14.0
74 IF	11302.6	2331.7	3000.7	1655.6	3291.2	450.4	2960.5	117.8	124.4	410.8	339.6	538.1	347.2	79.8	33.8	20.7
75 IF	8575.8	1769.2	2276.8	1256.2	2497.2	341.8	2246.3	89.4	94.4	311.7	257.7	408.3	263.5	60.5	25.7	15.7

[a]Weights were based on a reference area's breeding population index summed over the years 1961-75, modified to reflect the age and sex structure calculated for each year, and then divided by the numbers banded, which were also summed over the years. Weights were applied on the basis of the year of banding, regardless of the year of recovery (e.g., indirect recoveries).

Appendix B

Recovery Distribution Comparisons

Tables in this Appendix present results of extensive testing of recovery distribution patterns. Our purpose was to compare categories of mallard bandings or recoveries, or both, to identify those that could be combined, based on empirical evidence. Our use of a procedure, referred to as a centroid test, follows the recommendations of J. Nichols (personal communication). A brief explanation of the procedure is described under Methods. The test statistic for each comparison is distributed approximately as X^2 with 2 degrees of freedom. Since X^2 random variables are additive, a summary statistic for each reference area may be computed with degrees of freedom equal to twice the number of comparisons included. Continental test statistics were obtained as $-2 \sum_{i=1}^{n} ln\ P_i$, where P_i denotes the probability associated with the individual test statistic of reference area i, and n denotes the number of reference areas available for the test. This statistic is distributed as X^2 with $2n$ df under the null hypothesis. Although the X^2 approximation is valid for a total sample size of 17 or more recoveries, we compared sets of recoveries only where each was represented by 20 or more recoveries.

Only differences in recovery distributions that were significant at the 0.01 level are indicated in the tables, because the centroid test is also affected by variation in banding site or banding intensity. To provide more information we tabulated latitude–longitude differences (denoted Lat and Long in the tables) between centers (means) of recovery distributions if they were significant at the 0.01 level. Comparisons of banding or recovery-types, or both, include the following: (1) locals versus immatures (Table B-1), (2) immatures versus adults (Table B-2), (3) males versus females (Table B-3), (4) direct (HSS-1) versus indirect (HSS2-N) recoveries (Table B-4), (5) direct adults versus indirect immatures (Table B-5), (6) direct recoveries during consecutive years or year-groups (Table B-6), and (7) indirect recoveries of birds banded during consecutive years (Table B-7).

Table B-1. Results of testing the hypothesis that local and immature mallards have similar recovery distributions.

Major reference area and year group	Direct recoveries										Indirect recoveries									
	Male					Female					Male					Female				
	NL	NI	Test	Lat	Long	NL	NI	Test	Lat	Long	NL	NI	Test	Lat	Long	NL	NI	Test	Lat	Long
N Pacific (1)																				
1961 - 1975	19	42				8	55				7	22				2	21			
Reference area total[a]																				
N ALTA - N NWT (2)																				
1961 - 1975	18	386				11	296				7	358				5	195			
Reference area total																				
SW Alberta (3)																				
1961 - 1975	21	291	0.98			26	154	3.52			21	288	3.59			11	140			
Reference area total			0.98	(2 df)				3.52	(2 df)				3.59	(2 df)						
SW Saskatchewan (4)																				
1961 - 1967	49	239	10.28	3.7	4.5	52	196	6.04			60	465	2.99			24	185	5.24		
1968 - 1975	35	519	0.59			30	316	1.13			21	503	4.10			11	179			
Reference area total			10.87	(4 df)				7.17	(4 df)				7.09	(4 df)				5.24	(2 df)	
SE Saskatchewan (5)																				
1961 - 1967	88	140	1.19			63	76	7.30			87	174	1.84			34	67	2.83		
1968 - 1975	4	78				4	53				10	48				0	27			
Reference area total			1.19	(2 df)				7.30	(2 df)				1.84	(2 df)				2.83	(2 df)	
SW Manitoba (6)																				
1961 - 1967	26	225	13.32	0.9	1.7	21	141	2.98			12	158				3	89			
1968 - 1975	13	569				9	330				11	420				5	207			
Reference area total			13.32**	(2 df)				2.98	(2 df)											
N SASK-N MAN-W ONT (7)																				
1961 - 1975	6	250				3	197				3	188				1	78			
Reference area total																				
E ONT - W QUE (8)																				
1961 - 1965	5	275				6	290				5	209				1	130			
1966 - 1970	41	1306	6.61			39	1004	5.58			17	721				9	502			
1971 - 1975	24	1651	13.06	2.0	-2.5	21	1064	12.10	2.5	-2.0	11	842				7	415			
Reference area total			19.67**	(4 df)				17.68**	(4 df)											
Washington-Oregon (9)																				
1961 - 1967	50	939	55.00	1.1	-1.7	45	683	46.77	1.0	-1.7	59	504	42.34	1.8	-2.1	38	299	44.59	2.2	-1.0
1968 - 1975	5	690				6	480				3	305				3	232			
Reference area total			55.00**	(2 df)				46.77**	(2 df)				42.34**	(2 df)				44.59**	(2 df)	

Table B-1. Continued.

Major reference area and year group	Direct recoveries: Male NL	NI	Test	Lat	Long	Direct recoveries: Female NL	NI	Test	Lat	Long	Indirect recoveries: Male NL	NI	Test	Lat	Long	Indirect recoveries: Female NL	NI	Test	Lat	Long
N California (10)																				
1961 - 1975	22	685	3.87			12	323				4	382				5	146			
Reference area total			3.87 (2 df)																	
Intermountain (11)																				
1961 - 1967	20	568	19.75	-2.7	-0.9	10	327				11	578				5	261			
1968 - 1975	14	230				20	117	13.36	0.7	-2.0	9	167				6	78			
Reference area total			19.75** (2 df)					13.36** (2 df)												
High Plains (12)																				
1961 - 1965	27	226	10.68	0.6	1.2	34	148	19.32	-0.3	-0.2	77	325	0.74			35	138	7.94		
1966 - 1970	45	591	8.51			17	339				21	592	3.57			7	232			
1971 - 1975	34	310	1.57			24	180	8.66			11	204				5	96			
Reference area total			20.76** (6 df)					27.98** (4 df)					4.31 (4 df)					7.94 (2 df)		
Missouri R. Basin (13)																				
1961 - 1965	90	728	58.34	-1.4	1.0	65	446	40.63	1.0	1.7	93	713	4.60			56	394	8.83		
1966 - 1970	179	715	35.35	-0.7	0.7	132	492	51.19	1.2	1.5	117	630	2.62			75	308	17.87	0.2	1.2
1971 - 1975	76	864	1.11			53	574	4.70			25	339	10.48	3.0	3.8	15	166			
Reference area total			94.80** (6 df)					96.52** (6 df)					17.70** (6 df)					26.70** (4 df)		
Great Lakes (14)																				
1961 - 1962	15	296				11	319				7	246				19	281			
1963 - 1964	43	406	29.36	1.0	4.0	50	426	34.33	0.2	3.5	26	306	7.33			28	255	10.72	0.2	2.4
1965 - 1966	48	439	4.17			53	453	12.75	0.5	1.4	45	368	17.98	1.3	3.4	28	305	8.81		
1967 - 1968	59	617	30.97	1.9	4.4	64	525	51.12	2.6	5.3	47	596	17.92	1.2	4.1	34	366	31.87	1.1	4.7
1969 - 1970	145	713	112.24	0.8	3.6	107	555	114.91	2.0	4.7	75	399	16.92	0.9	2.6	51	320	33.80	1.5	3.7
1971 - 1972	77	371	76.36	2.4	5.5	61	341	73.86	2.9	5.0	23	237	7.34			23	188	23.02	2.2	4.7
1973 - 1975	98	892	63.03	1.9	4.0	70	801	44.94	1.4	3.5	19	198				13	209			
Reference area total			316.13** (12 df)					331.91** (12 df)					67.49** (10 df)					108.22** (10 df)		
Mid-Atlantic (15)																				
1961 - 1975	72	1245	28.99	-0.5	-1.8	66	980	20.77	-0.7	-1.7	51	816	0.56			42	589	2.64		
Reference area total			28.99** (2 df)					20.77** (2 df)					0.56 (2 df)					2.64 (2 df)		
NE United States (16)																				
1961 - 1975	47	1107	27.49	-0.1	-2.1	53	978	42.58	-0.1	-2.6	28	624	9.82	-0.8	-3.7	15	497			
Reference area total			27.49** (2 df)					42.58** (2 df)					9.82** (2 df)							
Continental total			540.53** (26 df)					549.53** (24 df)					119.59** (18 df)					167.11** (14 df)		

[a]The test statistic is distributed approximately as X with df = twice the number of comparisons included. Tests are not shown for sample sizes < 20 local (NL) or immature (NI) recoveries. Significance levels: <0.05 not indicated, ** <0.01; mean latitude-longitude differences are tabulated instead of '**'.

Table B-2. Results of testing the hypothesis that immature and adult mallards have similar recovery distributions.

Major reference area and year group	Direct recoveries – Male NI	NA	Test	Lat	Long	Direct recoveries – Female NI	NA	Test	Lat	Long	Indirect recoveries – Male NI	NA	Test	Lat	Long	Indirect recoveries – Female NI	NA	Test	Lat	Long
N Pacific (1)																				
1961 - 1975	42	21	0.14			55	18				22	21	0.06			21	16			
Reference area total[a]			0.14	(2 df)									0.06	(2 df)						
N ALTA - N NWT (2)																				
1961 - 1962	0	0				0	0				0	0				0	0			
1963 - 1966	137	80	26.20	5.7	6.9	85	25	6.29			137	117	6.82			71	37	0.27		
1967 - 1968	65	70	12.00	3.7	5.5	48	26	1.34			63	149	11.28	1.8	6.3	37	37	0.45		
1969 - 1970	105	27	7.53			97	22	0.68			96	61	13.51	1.4	6.7	60	25	6.40		
1971 - 1975	79	90	12.40	4.5	2.5	66	42	11.50	1.6	-3.5	62	75	5.14			27	28	0.13		
Reference area total			58.13**	(8 df)				19.81	(8 df)				36.75**	(8 df)				7.25	(8 df)	
SW Alberta (3)																				
1961 - 1966	61	60	13.72	4.0	1.8	28	21	0.09			64	123	7.54			27	21	0.25		
1967 - 1970	148	162	25.03	3.4	1.6	79	34	4.17			174	403	11.76	1.3	1.2	86	67	0.39		
1971 - 1975	82	143	27.68	3.9	3.0	47	21	0.30			50	142	3.98			27	29	4.43		
Reference area total			66.43**	(6 df)				4.56	(6 df)				23.28**	(6 df)				5.07	(6 df)	
SW Saskatchewan (4)																				
1961 - 1962	8	35				5	3				18	89				8	5			
1963 - 1964	73	97	10.58	4.0	2.8	48	29	5.37			105	190	1.89			37	30	1.19		
1965 - 1966	122	116	6.37			116	17				280	305	1.18			109	46	0.31		
1967 - 1968	39	87	0.46			30	21	1.09			101	296	0.27			40	43	0.84		
1969 - 1970	120	154	4.13			108	64	2.10			261	338	0.30			98	57	4.34		
1971 - 1972	182	276	33.43	5.0	3.5	93	62	4.57			124	356	0.78			41	66	9.27	-1.4	1.8
1973 - 1974	141	197	13.86	3.9	3.1	80	33	1.02			79	168	4.71			31	34	1.22		
1975	69	48	8.41			32	16													
Reference area total			77.24**	(14 df)				14.15	(10 df)				9.13	(12 df)				17.17	(12 df)	
SE Saskatchewan (5)																				
1961 - 1964	36	34	12.09	6.5	7.0	22	11				45	41	5.15			17	13			
1965 - 1966	62	75	15.26	1.6	2.9	31	24	1.34			80	137	2.26			34	24	1.72		
1967 - 1968	46	62	1.12			25	21	0.04			57	230	1.18			19	36			
1969 - 1975	74	150	16.80	5.2	3.1	51	37	2.07			40	89	1.05			23	11			
Reference area total			45.27**	(8 df)				3.45	(6 df)				9.64	(8 df)				1.72	(2 df)	
SW Manitoba (6)																				
1961 - 1966	168	70	21.75	4.2	2.7	108	43	0.79			101	135	2.03			64	26	4.83		
1967 - 1968	87	134	10.10	3.4	2.3	47	37	0.85			101	264	0.55			48	45	2.91		
1969 - 1970	179	139	5.26			94	57	2.29			187	219	15.21	-1.2	1.1	104	72	0.14		
1971 - 1972	129	199	14.43	2.9	2.5	95	65	6.89			118	236	8.90			55	33	2.78		
1973 - 1974	129	132	15.53	1.5	3.2	78	46	3.18			71	91	1.87			25	26	0.09		
1975	102	112	29.16	6.2	3.5	49	30	1.01												
Reference area total			96.23**	(12 df)				15.01	(12 df)				28.56**	(10 df)				10.75	(10 df)	

Table B-2. Continued.

Major reference area and year group	Direct recoveries, Male NI	NA	Test	Lat	Long	Direct recoveries, Female NI	NA	Test	Lat	Long	Indirect recoveries, Male NI	NA	Test	Lat	Long	Indirect recoveries, Female NI	NA	Test	Lat	Long
N SASK-N MAN-W ONT (7)																				
1961 - 1964	62	15				63	5				69	30	1.08			33	7			
1965 - 1968	56	7				45	11				70	18				25	8			
1969 - 1975	132	34	4.38			89	19				49	34	0.61			20	16			
Reference area total			4.38	(2 df)									1.69	(4 df)						
E ONT - W QUE (8)																				
1961 - 1964	127	28	5.87			136	40	0.09			84	24	7.44			59	27	6.87		
1965	148	48	11.21	1.3	0.3	154	62	4.48			125	62	22.44	-0.5	4.0	71	56	1.91		
1966	182	38	2.02			117	37	2.54			80	28	6.72			78	47	1.25		
1967	175	45	7.47			130	57	0.55			105	65	23.08	0.8	5.2	69	38	0.12		
1968	242	48	16.56	1.8	0.2	222	38	5.89			134	45	2.15			83	49	0.83		
1969	261	64	2.71			198	69	2.97			136	65	22.20	0.1	4.4	105	53	9.14		
1970	446	69	7.82			337	60	0.33			266	77	14.83	0.0	3.1	167	69	0.26		
1971	473	116	21.38	0.9	1.2	320	104	6.14			361	127	31.36	0.8	4.2	176	90	6.87		
1972	471	85	14.46	1.0	1.0	317	57	2.30			244	76	9.96	0.4	3.6	116	41	8.18		
1973	330	68	6.02			199	66	12.09	0.7	-0.7	182	58	2.05			89	50	0.05		
1974	193	68	0.41			98	51	0.07			55	30	7.02			34	20	4.96		
1975	184	60	9.89	0.9	1.8	130	54	5.67												
Reference area total			105.82**	(24 df)				43.12**	(24 df)				149.25**	(22 df)				40.44**	(22 df)	
Washington-Oregon (9)																				
1961 - 1962	261	94	56.94	1.2	1.3	153	65	27.68	1.1	0.8	144	168	10.85	1.5	0.2	95	66	7.22		
1963 - 1964	289	83	56.96	-0.2	0.8	252	60	68.01	0.5	1.0	122	98	0.19			72	50	3.02		
1965 - 1966	266	87	24.19	1.6	0.6	226	131	18.93	0.5	0.6	183	118	5.31			93	116	2.62		
1967 - 1968	212	63	11.28	1.6	0.2	115	71	1.61			99	70	3.28			77	73	4.84		
1969 - 1970	212	75	0.54			164	70	8.67			123	96	1.99			92	59	2.79		
1971 - 1972	164	46	3.53			128	76	5.97			78	46	2.02			65	64	11.03	0.4	1.2
1973 - 1974	225	63	3.65			125	48	1.43			60	45	0.54			37	15			
1975	0	0				0	0													
Reference area total			157.09**	(14 df)				132.30**	(14 df)				24.18	(14 df)				31.52**	(12 df)	
N California (10)																				
1961 - 1962	85	46	11.66	-0.1	-0.4	34	30	4.29			42	97	0.57			30	27	2.27		
1963 - 1964	48	76	10.95	1.2	0.1	32	36	3.94			56	115	5.07			22	34	3.11		
1965 - 1966	80	86	57.36	1.4	1.2	57	21	17.88	0.7	1.4	58	119	6.58			17	27			
1967 - 1968	130	94	5.52			60	72	2.66			78	128	2.00			25	66	1.06		
1969 - 1970	75	79	12.81	0.8	0.0	22	49	6.24			46	108	3.50			13	48			
1971 - 1972	117	109	1.51			50	69	0.50			45	90	3.85			18	40			
1973 - 1974	107	75	3.68			53	60	6.18			57	66	2.14			21	27	1.65		
1975	43	62	4.78			15	26													
Reference area total			108.27**	(16 df)				41.69**	(14 df)				23.71	(14 df)				8.09	(8 df)	

Table B-2. Continued.

Major reference area and year group	Direct recoveries										Indirect recoveries									
	Male					Female					Male					Female				
	NI	NA	Test	Lat	Long	NI	NA	Test	Lat	Long	NI	NA	Test	Lat	Long	NI	NA	Test	Lat	Long
Intermountain (11)																				
1961 - 1962	97	119	0.43			74	63	1.38			103	175	3.70			57	71	0.48		
1963 - 1964	164	129	6.83			98	65	6.90			188	216	0.73			69	66	0.20		
1965 - 1966	242	161	7.32			130	98	4.00			239	238	1.91			117	123	0.08		
1967 - 1968	116	86	25.58	-1.9	2.0	56	55	3.34			90	126	24.91	-1.3	3.1	32	37	8.42		
1969 - 1970	80	55	5.04			44	18				75	68	3.77			43	16			
1971 - 1975	99	56	4.25			42	40	0.44			50	49	4.80			21	36	3.84		
Reference area total			49.45** (12 df)					16.06 (10 df)					39.82** (12 df)					13.02 (10 df)		
High Plains (12)																				
1961 - 1962	10	18				5	5				23	60	0.21			8	12			
1963 - 1964	128	146	58.65	-1.9	2.2	78	81	16.07	0.5	0.9	151	295	26.70	-0.8	2.2	55	79	2.38		
1965 - 1966	235	218	82.75	-1.1	1.8	168	114	55.66	-0.7	0.8	270	496	36.33	-0.4	2.3	121	97	1.17		
1967 - 1968	218	208	38.62	-0.9	1.4	132	118	32.66	-0.4	1.2	278	421	28.27	-0.6	1.5	86	151	13.54	-0.6	0.5
1969 - 1970	226	232	11.44	-0.4	0.1	104	96	4.54			195	289	2.97			100	98	2.17		
1971 - 1972	109	147	11.98	-1.1	0.7	72	63	5.96			125	199	13.56	0.3	1.8	43	53	0.60		
1973 - 1974	116	89	2.75			69	42	3.98			79	84	0.97			53	33	1.03		
1975	85	61	0.46			39	34	10.48	-2.4	-0.3										
Reference area total			206.65** (14 df)					129.35** (14 df)					109.01** (14 df)					20.89 (12 df)		
Missouri R. Basin (13)																				
1961 - 1962	100	156	27.20	3.5	1.5	63	55	5.71			101	364	0.51			60	85	3.16		
1963 - 1964	506	310	120.70	3.4	0.8	318	279	27.75	1.8	0.1	405	502	3.01			224	314	8.50		
1965 - 1966	402	273	55.49	2.3	0.9	260	249	14.38	1.2	0.2	405	573	1.28			190	343	6.29		
1967 - 1968	206	226	26.60	2.6	1.2	126	170	0.45			222	396	0.60			113	195	3.49		
1969 - 1970	229	136	43.78	4.2	0.7	171	74	27.65	3.6	1.7	210	281	0.38			115	104	5.13		
1971 - 1972	335	229	59.94	3.3	2.6	210	87	5.04			194	251	0.86			92	89	2.45		
1973 - 1974	360	227	62.51	2.8	2.1	227	72	12.45	2.1	0.8	145	218	1.68			74	61	0.69		
1975	169	91	45.05	4.3	3.8	137	74	18.17	3.8	1.6										
Reference area total			441.27** (16 df)					111.60** (16 df)					8.32 (14 df)					29.71** (14 df)		
Great Lakes (14)																				
1961	158	64	13.61	1.8	1.6	137	93	13.69	1.5	0.8	128	140	13.03	-0.1	2.7	111	175	4.32		
1962	138	67	1.56			182	153	1.98			118	98	4.33			170	242	12.04	-0.1	0.6
1963	161	33	5.23			194	126	2.27			139	61	9.06			123	125	0.17		
1964	245	37	10.81	2.8	1.9	232	92	3.27			167	60	10.20	1.0	2.6	132	119	3.38		
1965	140	30	5.83			162	50	3.78			189	83	2.94			171	107	1.74		
1966	299	88	28.57	2.5	2.4	291	209	4.73			179	121	7.20			134	197	0.50		
1967	307	69	24.67	1.4	1.5	249	103	11.68	1.2	0.2	250	99	10.03	-0.6	2.0	156	126	1.89		
1968	310	65	4.79			276	116	12.78	0.9	1.7	346	148	15.98	0.4	2.3	210	162	8.69		
1969	400	74	19.15	1.4	1.0	306	92	25.41	1.1	-0.7	257	129	34.82	0.8	3.7	199	109	4.44		

Table B-2. Continued.

Major reference area and year group	Direct recoveries: Male NI	NA	Test	Lat	Long	Direct recoveries: Female NI	NA	Test	Lat	Long	Indirect recoveries: Male NI	NA	Test	Lat	Long	Indirect recoveries: Female NI	NA	Test	Lat	Long
Great Lakes (14) -- Continued																				
1970	313	60	53.76	2.0	3.5	249	111	20.10	1.2	0.0	142	99	39.31	0.6	4.9	121	84	0.54		
1971	147	43	14.36	1.3	2.8	162	67	3.60			81	57	9.75	1.0	5.0	79	58	6.50		
1972	224	104	15.06	1.2	2.3	179	95	0.12			156	100	17.02	-0.6	3.4	109	119	0.59		
1973	317	68	24.17	2.0	2.2	270	88	8.23			128	80	21.57	0.1	3.7	141	76	5.77		
1974	279	71	26.60	2.9	1.8	264	69	1.57			70	44	10.98	0.9	3.6	68	19			
1975	296	63	17.79	1.5	1.6	267	101	20.28	1.0	1.8										
Reference area total			265.96** (30 df)					133.49** (30 df)					206.22** (28 df)					50.57** (26 df)		
Mid-Atlantic (15)																				
1961 - 1962	119	24	23.48	2.6	0.3	112	34	36.77	1.3	0.1	103	67	29.92	1.3	4.6	65	27	6.88		
1963 - 1964	150	60	32.12	1.8	0.4	128	63	10.56	1.3	0.1	107	80	2.89			94	93	5.41		
1965 - 1966	284	55	48.29	1.1	0.5	215	99	31.74	1.0	0.6	198	132	16.41	0.0	2.2	165	113	4.37		
1967 - 1968	168	48	11.07	1.4	0.2	115	50	2.53			163	66	23.41	0.7	4.4	105	42	0.94		
1969 - 1970	141	40	32.78	1.2	-1.3	109	31	5.35			111	56	16.87	0.2	3.5	64	29	0.32		
1971 - 1972	190	107	37.11	1.2	-0.2	148	78	12.42	0.6	-0.3	100	105	15.27	0.5	2.9	61	50	6.70		
1973 - 1974	120	41	2.25			102	43	3.60			34	22	12.87	0.1	4.1	35	15			
1975	73	30	9.18			51	39	17.57	1.7	-0.8										
Reference area total			196.28** (16 df)					120.54** (16 df)					117.64** (14 df)					24.62 (12 df)		
NE United States (16)																				
1961 - 1962	97	28	7.64			94	24	5.90			70	27	4.92			58	24	2.30		
1963 - 1964	155	19				142	32	2.10			117	21	5.47			88	37	2.13		
1965 - 1966	243	25	12.72	2.2	-0.4	202	40	0.22			120	27	3.07			103	32	2.57		
1967 - 1968	176	34	6.99			162	48	1.26			143	38	17.19	-1.1	5.3	116	30	1.54		
1969 - 1970	145	32	2.80			138	42	1.92			89	49	2.52			69	31	1.86		
1971 - 1972	89	38	12.51	1.2	-1.8	89	23	2.76			55	33	2.39			35	19			
1973 - 1974	141	28	3.07			87	24	1.02			30	14				28	15			
1975	61	9				64	17													
Reference area total			45.73** (12 df)					15.18 (14 df)					35.56** (12 df)					10.40 (10 df)		
Continental total			1384.88** (32 df)					455.83** (28 df)					480.13** (32 df)					74.29** (28 df)		

[a]The test statistic is distributed approximately as X with df = twice the number of comparisons included. Tests are not shown for sample sizes < 20 immature (NI) or adult (NA) recoveries. Significance levels: <0.05 not indicated, ** <0.01; mean latitude-longitude differences are tabulated instead of '**'.

Table B-3. Results of testing the hypothesis that male and female mallards have similar recovery distributions.

Major reference area and year group	Direct recoveries: Immature NM	Direct recoveries: Immature NF	Direct recoveries: Immature Test	Direct recoveries: Immature Lat	Direct recoveries: Immature Long	Direct recoveries: Adult NM	Direct recoveries: Adult NF	Direct recoveries: Adult Test	Direct recoveries: Adult Lat	Direct recoveries: Adult Long	Indirect recoveries: Immature NM	Indirect recoveries: Immature NF	Indirect recoveries: Immature Test	Indirect recoveries: Immature Lat	Indirect recoveries: Immature Long	Indirect recoveries: Adult NM	Indirect recoveries: Adult NF	Indirect recoveries: Adult Test	Indirect recoveries: Adult Lat	Indirect recoveries: Adult Long
N Pacific (1)																				
1961 - 1975	42	55	2.50			21	18				22	21	6.50			21	16			
Reference area total[a]			2.50	(2 df)									6.50	(2 df)						
N ALTA - N NWT (2)																				
1961 - 1962	0	0				0	0				0	0				0	0			
1963 - 1966	137	85	1.64			80	25	0.49			137	71	1.88			117	37	7.10		
1967 - 1968	65	48	3.32			70	26	4.17			63	37	1.03			149	37	6.11		
1969 - 1970	105	97	4.72			27	22	2.42			96	60	3.18			61	25	0.10		
1971 - 1975	79	66	0.78			90	42	8.36			62	27	6.82			75	28	1.55		
Reference area total			10.46	(8 df)				15.44	(8 df)				12.91	(8 df)				14.86	(8 df)	
SW Alberta (3)																				
1961 - 1966	61	28	3.20			60	21	1.15			64	27	0.16			123	21	6.17		
1967 - 1970	148	79	2.76			162	34	0.38			174	86	0.01			403	67	5.62		
1971 - 1975	82	47	3.64			143	21	0.44			50	27	0.34			142	29	10.89	-3.8	-2.3
Reference area total			9.60	(6 df)				1.97	(6 df)				0.51	(6 df)				22.68**	(6 df)	
SW Saskatchewan (4)																				
1961 - 1962	8	5				35	3				18	8				89	5			
1963 - 1964	78	48	3.30			97	29	2.11			105	37	2.80			190	30	1.55		
1965 - 1966	122	116	1.95			116	17				280	109	1.29			305	46	1.31		
1967 - 1968	39	30	0.38			87	21	1.64			101	40	0.24			296	43	0.48		
1969 - 1970	120	108	1.62			154	64	0.84			261	98	3.61			338	57	7.80		
1971 - 1972	182	93	0.45			276	62	4.06			124	41	2.26			356	66	5.73		
1973 - 1974	141	80	1.18			197	33	2.87			79	31	1.52			168	34	0.42		
1975	68	32	0.28			46	16													
Reference area total			9.16	(14 df)				11.52	(10 df)				11.72	(12 df)				17.29	(12 df)	
SE Saskatchewan (5)																				
1961 - 1964	36	22	0.84			34	11				45	17				41	13			
1965 - 1966	62	31	0.69			75	24	7.63			80	34	6.33			137	24	0.75		
1967 - 1968	46	25	1.00			62	21	0.08			57	19				230	36	1.60		
1969 - 1975	74	51	2.81			150	37	3.74			40	23	3.71			89	11			
Reference area total			5.34	(8 df)				11.45	(6 df)				10.04	(4 df)				2.35	(4 df)	
SW Manitoba (6)																				
1961 - 1966	168	108	0.58			70	43	6.63			101	64	8.27			135	26	5.15		
1967 - 1968	87	47	0.02			134	37	2.62			101	48	13.25	-2.2	0.2	264	45	5.57		
1969 - 1970	179	94	0.63			139	57	1.30			187	104	30.64	-1.5	1.6	219	72	1.97		
1971 - 1972	129	95	9.20			199	65	3.72			118	55	3.34			236	33	0.03		
1973 - 1974	129	78	9.69	-0.6	0.7	132	46	2.74			71	25	1.31			91	26	4.15		
1975	102	49	1.98			112	30	5.97												
Reference area total			22.10	(12 df)				22.98	(12 df)				56.81**	(10 df)				16.87	(10 df)	

Table B-3. Continued.

Major reference area and year group	Direct recoveries: Immature NM	NF	Test	Lat	Long	Direct recoveries: Adult NM	NF	Test	Lat	Long	Indirect recoveries: Immature NM	NF	Test	Lat	Long	Indirect recoveries: Adult NM	NF	Test	Lat	Long
N SASK-N MAN-W ONT (7)																				
1961 - 1964	62	63	1.28			15	5				69	33	7.33			30	7			
1965 - 1968	56	45	5.12			7	11				70	25	0.84			18	8			
1969 - 1975	132	89	0.27			34	19				49	20	4.73			34	16			
Reference area total			6.67	(6 df)									12.90	(6 df)						
E ONT - W QUE (8)																				
1961 - 1964	127	136	11.31	0.1	1.1	28	40	3.85			84	59	14.39	-0.2	4.3	24	27	14.78	-1.8	1.4
1965	148	154	0.79			48	62	1.21			125	71	29.59	-2.0	3.1	62	56	2.38		
1966	182	117	0.45			38	37	0.78			80	78	8.22			28	47	0.44		
1967	175	130	4.26			45	57	5.27			105	69	26.80	-1.0	5.2	65	38	4.75		
1968	242	222	6.46			48	38	11.95	-2.1	-1.0	134	83	14.44	-0.5	3.1	45	49	12.70	-1.9	1.3
1969	261	198	0.43			64	69	2.98			136	105	11.65	0.4	3.7	65	53	1.88		
1970	446	337	2.48			69	60	1.93			266	167	39.91	-0.2	5.3	77	69	5.19		
1971	473	320	2.65			116	104	5.51			361	176	47.19	-0.5	4.7	127	90	14.92	-2.0	1.4
1972	471	317	4.25			85	57	6.82			244	116	26.89	-1.5	3.8	76	41	3.92		
1973	330	199	1.07			68	66	6.85			182	89	10.82	-0.3	3.3	58	50	8.37		
1974	193	98	3.60			68	51	2.26			55	34	3.94			30	20	4.27		
1975	184	130	2.15			60	54	6.61												
Reference area total			39.90	(24 df)				56.02**	(24 df)				233.84**	(22 df)				73.60**	(22 df)	
Washington-Oregon (9)																				
1961 - 1962	261	153	3.66			94	65	2.89			144	95	1.92			168	66	3.64		
1963 - 1964	289	252	9.91	-0.2	-0.2	83	60	1.25			122	72	0.92			98	50	1.60		
1965 - 1966	266	226	2.73			87	131	5.38			183	93	2.03			118	116	11.78	-1.2	0.4
1967 - 1968	212	115	5.91			63	71	9.59	-1.7	0.0	99	77	3.14			70	73	0.73		
1969 - 1970	212	164	1.59			75	70	7.88			123	92	5.20			96	59	0.84		
1971 - 1972	164	128	5.16			46	76	1.74			78	65	2.20			46	64	6.06		
1973 - 1974	225	125	1.17			63	48	2.94			60	37	0.63			45	15			
1975	0	0				0	0													
Reference area total			30.13**	(14 df)				31.67**	(14 df)				16.04	(14 df)				24.65	(12 df)	
N California (10)																				
1961 - 1962	85	34	3.29			46	30	4.17			42	30	1.39			97	27	1.85		
1963 - 1964	48	32	0.39			76	36	3.30			56	22	0.39			115	34	3.67		
1965 - 1966	80	57	2.83			86	21	0.24			58	17				119	27	2.04		
1967 - 1968	130	60	2.34			94	72	8.46			78	25	0.48			128	66	6.61		
1969 - 1970	75	22	2.20			79	49	3.18			46	13				108	48	0.92		
1971 - 1972	117	50	0.02			109	69	4.57			45	18				90	40	1.42		
1973 - 1974	107	53	0.57			75	60	1.16			57	21	0.27			66	27	1.92		
1975	43	15				62	26	0.43												
Reference area total			11.64	(14 df)				25.51	(16 df)				2.53	(8 df)				18.43	(14 df)	

Table B-3. Continued.

Major reference area and year group	Direct recoveries: Immature NM	NF	Test	Lat	Long	Direct recoveries: Adult NM	NF	Test	Lat	Long	Indirect recoveries: Immature NM	NF	Test	Lat	Long	Indirect recoveries: Adult NM	NF	Test	Lat	Long
Intermountain (11)																				
1961 - 1962	97	74	4.11			119	63	3.30			103	57	0.29			175	71	4.99		
1963 - 1964	164	98	0.57			129	65	4.21			188	69	7.93			216	66	21.41	-2.1	-0.7
1965 - 1966	242	130	2.70			161	98	2.89			239	117	0.32			238	123	1.16		
1967 - 1968	116	56	1.70			86	55	10.71	2.0	-1.1	90	32	5.14			126	37	2.77		
1969 - 1970	80	44	2.52			55	18				75	43	1.87			68	16			
1971 - 1975	99	42	1.12			56	40	0.01			50	21	0.95			49	36	2.77		
Reference area total			12.72		(12 df)			21.12		(10 df)			16.50		(12 df)			33.10**		(10 df)
High Plains (12)																				
1961 - 1962	10	5				18	5				23	8				60	12			
1963 - 1964	128	78	4.45			146	81	29.33	1.7	-1.8	151	55	0.98			295	79	18.47	0.4	-2.1
1965 - 1966	235	168	5.17			218	114	11.74	0.8	-1.2	270	121	0.42			496	97	20.15	0.4	-1.8
1967 - 1968	218	132	0.89			208	118	12.88	0.6	-0.5	278	86	4.20			421	151	5.55		
1969 - 1970	226	104	7.89			232	96	2.31			195	100	0.68			289	98	11.89	0.5	-1.0
1971 - 1972	109	72	4.16			147	63	0.33			125	43	5.37			199	53	21.92	-0.2	-1.8
1973 - 1974	116	69	1.67			89	42	2.50			79	53	1.30			84	33	0.53		
1975	85	39	2.32			61	34	5.07												
Reference area total			26.55		(14 df)			64.16**		(14 df)			12.95		(12 df)			78.51**		(12 df)
Missouri R. Basin (13)																				
1961 - 1962	100	63	0.56			156	55	0.69			101	60	10.13	-2.9	-0.5	364	85	4.77		
1963 - 1964	506	318	10.55	1.2	0.4	310	279	1.95			405	224	15.26	-1.3	-0.4	502	314	21.37	-1.4	-1.1
1965 - 1966	402	260	6.99			273	249	3.33			405	190	31.16	-1.8	0.2	573	343	24.22	-1.4	-0.6
1967 - 1968	206	126	5.07			226	170	5.92			222	113	12.56	-1.9	0.1	396	195	12.28	-0.1	1.0
1969 - 1970	229	171	3.48			136	74	9.06			210	115	27.02	-2.2	0.5	281	104	6.90		
1971 - 1972	335	210	1.26			229	87	8.92			194	92	15.26	-2.1	-0.1	251	89	14.19	-2.1	-0.1
1973 - 1974	360	227	16.66	-0.4	0.5	227	72	3.51			145	74	12.74	-1.9	0.6	218	61	8.22		
1975	169	137	1.29			91	74	9.79	-0.7	-2.1										
Reference area total			45.86**		(16 df)			43.17**		(16 df)			124.13**		(14 df)			91.95**		(14 df)
Great Lakes (14)																				
1961	158	137	6.30			64	93	0.98			128	111	30.62	-0.3	3.0	140	175	31.35	-0.9	0.0
1962	138	182	2.23			67	153	4.74			118	170	17.55	-0.9	0.8	98	242	25.02	-0.5	0.5
1963	161	194	3.04			33	126	4.10			139	123	21.62	-0.5	1.5	61	125	8.36		
1964	245	232	0.80			37	92	4.68			167	132	26.37	-1.0	1.7	60	119	5.64		
1965	140	162	6.47			30	50	0.87			189	171	19.81	-0.8	0.9	83	107	5.29		
1966	299	291	6.60			88	209	12.33	-1.6	-1.6	179	134	21.05	-0.2	2.4	121	197	14.37	-0.6	-0.4
1967	307	249	1.66			69	103	6.05			250	156	30.21	-1.5	1.5	99	126	8.93		
1968	310	276	3.02			65	116	2.05			346	210	42.46	-1.5	1.1	148	162	8.29		
1969	400	306	0.84			74	92	5.72			257	199	56.52	-1.3	1.7	129	109	24.96	-2.1	-2.2

Table B-3. Continued.

Major reference area and year group	Direct recoveries: Immature NM	NF	Test	Lat	Long	Direct recoveries: Adult NM	NF	Test	Lat	Long	Indirect recoveries: Immature NM	NF	Test	Lat	Long	Indirect recoveries: Adult NM	NF	Test	Lat	Long
Great Lakes (14) -- Continued																				
1970	313	249	11.54	-0.3	0.8	60	111	14.84	-1.0	-2.7	142	121	20.17	-0.7	2.5	99	84	12.86	-1.4	-1.9
1971	147	162	6.09			43	67	11.76	-0.2	-2.8	81	79	13.78	-0.2	2.1	57	58	2.02		
1972	224	179	0.76			104	95	8.29			156	109	22.78	-2.0	1.1	100	119	12.11	-0.7	-1.5
1973	317	270	0.24			68	88	1.94			128	141	43.24	-3.1	0.6	80	76	25.69	-3.4	-1.3
1974	279	264	1.60			71	69	18.21	-2.6	-1.9	70	68	13.62	-0.8	2.1	44	19			
1975	296	267	0.31			63	101	2.21												
Reference area total			51.50** (30 df)					98.77** (30 df)					379.80** (28 df)					184.89** (26 df)		
Mid-Atlantic (15)																				
1961 - 1962	119	112	8.82			24	34	8.06			103	65	7.73			67	27	0.23		
1963 - 1964	150	128	7.03			60	63	1.33			107	94	6.07			80	93	2.79		
1965 - 1966	284	215	7.27			55	99	0.92			198	165	26.71	-1.0	1.9	132	113	5.56		
1967 - 1968	168	115	2.81			48	50	7.87			163	105	5.68			66	42	1.45		
1969 - 1970	141	109	1.53			40	31	3.44			111	64	9.31	0.1	3.5	56	29	0.32		
1971 - 1972	190	148	13.64	0.6	0.2	107	78	1.14			100	61	4.06			105	50	1.13		
1973 - 1974	120	102	1.17			41	43	3.93			34	35	12.73	-0.9	5.4	22	15			
1975	73	51	1.89			30	39	0.90												
Reference area total			44.16** (16 df)					27.59 (16 df)					72.29** (14 df)					11.48 (12 df)		
NE United States (16)																				
1961 - 1962	97	94	3.99			28	24	0.73			70	58	8.48			27	24	0.19		
1963 - 1964	155	142	0.23			19	32				117	88	8.95			21	37	1.99		
1965 - 1966	243	202	1.50			25	40	8.68			120	103	14.08	-0.5	3.8	27	32	7.59		
1967 - 1968	176	162	2.97			34	48	2.78			143	116	23.78	-1.5	3.3	38	30	1.53		
1969 - 1970	145	138	1.02			32	42	1.45			89	69	12.98	-0.7	3.5	49	31	0.46		
1971 - 1972	89	89	0.93			38	23	1.27			55	35	9.62	-0.7	3.7	33	19			
1973 - 1974	141	87	2.11			28	24	0.85			30	28	3.07			14	15			
1975	61	64	0.08			9	17													
Reference area total			12.83 (16 df)					15.76 (12 df)					80.96** (14 df)					11.76 (10 df)		
Continental total			92.77** (32 df)					162.68** (28 df)					705.05** (32 df)					318.34** (28 df)		

[a]The test statistic is distributed approximately as X with df = twice the number of comparisons included. Tests are not shown for sample sizes < 20 male (NM) or female (NF) recoveries. Significance levels: <0.05 not indicated, ** <0.01; mean latitude-longitude differences are tabulated instead of '**'.

Table B-4. Results of testing the hypothesis that direct and indirect recovery distributions of mallards are similar.

Major reference area and year group	Adult recoveries: Male ND	Male NI	Male Test	Male Lat	Male Long	Adult recoveries: Female ND	Female NI	Female Test	Female Lat	Female Long	Immature recoveries: Male ND	Male NI	Male Test	Male Lat	Male Long	Immature recoveries: Female ND	Female NI	Female Test	Female Lat	Female Long
N Pacific (1)																				
1961 through 1974	18	21				18	16				40	22	20.31	2.5	5.9	51	21	7.55		
Reference area total[a]													20.31**	(2 df)				7.55	(2 df)	
N ALTA - N NWT (2)																				
1961 - 1962	0	0				0	0				0	0				0	0			
1963 - 1966	80	117	2.48			25	37	0.40			137	137	30.80	5.7	6.1	85	71	18.94	5.3	2.3
1967 - 1968	70	149	3.37			26	37	0.10			65	63	7.54			48	37	1.80		
1969 - 1970	27	61	2.75			22	25	1.45			105	96	21.35	5.3	2.4	97	60	14.38	5.5	5.8
1971 - 1974	77	75	1.13			40	28	3.12			74	62	23.30	7.0	6.1	60	27	1.97		
Reference area total			9.73	(8 df)				5.07	(8 df)				82.99**	(8 df)				37.09**	(8 df)	
SW Alberta (3)																				
1961 - 1966	60	123	10.93	1.9	4.6	21	21	1.22			61	64	22.63	5.7	3.6	28	27	1.49		
1967 - 1970	162	403	13.81	1.2	1.7	34	67	0.62			148	174	30.36	3.3	2.2	79	86	10.18	2.0	0.6
1971 - 1974	127	142	1.14			17	29				72	50	17.33	2.6	0.3	40	27	0.69		
Reference area total			25.88**	(6 df)				1.84	(4 df)				70.32**	(6 df)				12.36	(6 df)	
SW Saskatchewan (4)																				
1961 - 1964	132	279	0.87			32	35	6.57			86	123	25.22	5.1	2.6	53	45	0.28		
1965 - 1966	116	305	2.58			17	46				122	280	9.28	2.4	2.3	116	109	4.80		
1967 - 1968	87	296	3.86			21	43	0.69			39	101	1.90			30	40	3.79		
1969 - 1970	154	338	1.98			64	57	6.01			120	261	6.64			108	98	1.26		
1971 - 1972	276	356	0.26			62	66	0.35			182	124	28.71	4.9	3.5	93	41	15.29	3.8	0.5
1973 - 1974	197	168	15.51	3.0	1.8	33	34	5.70			141	79	17.35	5.2	4.6	80	31	5.87		
Reference area total			25.06	(12 df)				19.32	(10 df)				89.10**	(12 df)				31.29**	(12 df)	
SE Saskatchewan (5)																				
1961 - 1964	34	41	6.87			11	13				36	45	28.64	7.2	5.9	22	17			
1965 - 1966	75	137	8.79			24	24	2.02			62	80	5.61			31	34	0.41		
1967 - 1968	62	230	0.85			21	36	2.43			46	57	2.04			25	19			
1969 - 1974	52	89	5.29			22	11				33	40	4.99			17	23			
Reference area total			21.80**	(8 df)				4.45	(4 df)				41.28**	(8 df)				0.41	(2 df)	
SW Manitoba (6)																				
1961 - 1966	70	135	6.39			43	26	7.60			168	101	58.97	5.7	1.9	108	64	9.47	2.6	0.7
1967 - 1968	134	264	13.97	0.8	-0.8	37	45	0.49			87	101	31.51	4.6	1.7	47	48	1.22		
1969 - 1970	139	219	3.65			57	72	3.62			179	187	47.59	4.2	0.8	94	104	14.49	2.4	2.5
1971 - 1972	199	236	5.02			65	33	6.03			129	118	16.11	3.3	1.2	95	55	7.78		
1973 - 1974	132	91	17.16	3.0	-0.1	46	26	0.15			129	71	16.04	4.6	2.0	78	25	2.61		
Reference area total			46.19**	(10 df)				17.89	(10 df)				170.22**	(10 df)				35.57**	(10 df)	

Table B-4. Continued.

Major reference area and year group	Adult recoveries										Immature recoveries									
	Male					Female					Male					Female				
	ND	NI	Test	Lat	Long	ND	NI	Test	Lat	Long	ND	NI	Test	Lat	Long	ND	NI	Test	Lat	Long
N SASK-N MAN-W ONT (7)																				
1961 - 1964	15	30				5	7				62	69	19.69	3.9	-0.6	63	33	3.39		
1965 - 1968	7	18				11	8				56	70	17.12	2.6	-0.1	45	25	3.64		
1969 - 1974	33	34	10.45	5.1	2.0	18	16				68	49	18.76	4.5	2.5	43	20	5.84		
Reference area total			10.45**	(2 df)									55.57**	(6 df)				12.87	(6 df)	
E ONT - W QUE (8)																				
1961 - 1964	28	24	8.80			40	27	1.82			127	84	61.02	2.6	-4.0	136	59	32.69	2.4	-0.8
1965	48	62	9.33	1.2	-0.7	62	56	13.33	2.0	-0.9	148	125	95.30	2.9	-4.3	154	71	7.09		
1966	38	28	9.83	1.9	-1.4	37	47	3.84			182	80	36.06	1.4	-4.6	117	78	10.20	1.5	-0.8
1967	45	65	9.14			57	38	5.21			175	105	81.60	2.0	-5.6	130	69	5.31		
1968	48	45	6.07			38	49	5.97			242	134	97.51	2.1	-4.1	222	83	34.48	1.9	-1.3
1969	64	65	12.61	1.6	-2.1	69	53	6.01			261	136	90.69	2.2	-6.4	198	105	47.17	2.5	-3.0
1970	69	77	15.61	1.2	-3.2	60	69	5.54			446	266	151.84	1.7	-6.6	337	167	21.16	1.5	-1.5
1971	116	127	24.49	1.8	-2.9	104	90	2.25			473	361	179.86	1.8	-5.8	320	176	28.98	1.6	-1.4
1972	85	76	9.65	1.2	-1.9	57	41	12.78	1.2	-1.9	471	244	117.71	1.8	-4.6	317	116	2.69		
1973	68	58	17.91	1.3	-3.6	66	50	2.19			330	182	45.89	1.5	-4.4	199	89	8.46		
1974	68	30	8.73			51	20	7.23			193	55	28.37	1.0	-6.9	98	34	0.88		
Reference area total			132.17**	(22 df)				66.17**	(22 df)				985.85**	(22 df)				199.11**	(22 df)	
Washington-Oregon (9)																				
1961 - 1962	94	168	7.08			65	66	6.72			261	144	57.35	0.0	1.8	153	95	33.01	0.2	1.5
1963 - 1964	83	98	3.33			60	50	2.01			289	122	69.60	0.3	1.2	252	72	58.77	0.9	1.8
1965 - 1966	87	118	1.85			131	116	7.38			266	183	31.16	1.0	1.3	226	93	14.94	0.4	1.3
1967 - 1968	63	70	3.09			71	73	4.69			212	99	2.75			115	77	1.75		
1969 - 1970	75	96	2.27			70	59	3.31			212	123	19.93	-0.4	1.5	164	92	7.23		
1971 - 1972	46	46	2.38			76	64	7.44			164	78	5.84			128	65	0.13		
1973 - 1974	63	45	6.43			48	15				225	60	2.30			125	37	0.68		
Reference area total			26.43	(14 df)				31.55**	(12 df)				188.93**	(14 df)				116.51**	(14 df)	
N California (10)																				
1961 - 1962	46	97	1.24			30	27	3.30			85	42	0.58			34	30	0.32		
1963 - 1964	76	115	6.10			36	34	2.07			48	56	3.98			32	22	2.40		
1965 - 1966	86	119	5.66			21	27	0.27			80	58	27.25	0.8	1.3	57	17			
1967 - 1968	94	128	0.34			72	66	1.42			130	78	2.50			60	25	1.14		
1969 - 1970	79	108	4.64			49	48	5.26			75	46	13.84	0.6	0.7	22	13			
1971 - 1972	109	90	0.62			69	40	8.43			117	45	7.37			50	18			
1973 - 1974	75	66	4.96			60	27	3.20			107	57	5.71			53	21	3.69		
Reference area total			23.56	(14 df)				23.95	(14 df)				61.23**	(14 df)				7.55	(8 df)	

Table B-4. Continued.

Major reference area and year group	Adult recoveries										Immature recoveries									
	Male					Female					Male					Female				
	ND	NI	Test	Lat	Long	ND	NI	Test	Lat	Long	ND	NI	Test	Lat	Long	ND	NI	Test	Lat	Long
Intermountain (11)																				
1961 - 1962	119	175	13.35	0.9	-0.4	63	71	2.43			97	103	4.32			74	57	1.48		
1963 - 1964	129	216	8.47			65	66	2.15			164	188	0.58			98	69	5.12		
1965 - 1966	161	238	2.09			98	123	1.64			242	239	0.09			130	117	1.55		
1967 - 1968	86	126	0.89			55	37	14.91	-2.7	0.2	116	90	15.14	-0.7	0.1	56	32	0.69		
1969 - 1970	55	68	4.05			18	16				80	75	8.40			44	43	2.35		
1971 - 1974	47	49	1.31			33	36	0.32			78	50	0.18			37	21	0.87		
Reference area total			30.16** (12 df)					21.45 (10 df)					28.71** (12 df)					12.06 (12 df)		
High Plains (12)																				
1961 - 1964	164	355	8.57			86	91	15.12	-1.8	0.8	138	174	50.97	-1.6	0.4	83	63	11.02	-0.8	1.3
1965 - 1966	218	496	26.41	-0.9	1.1	114	97	5.42			235	270	104.80	-1.6	0.5	168	121	93.34	-1.9	0.4
1967 - 1968	208	421	17.17	-0.7	0.6	118	151	11.82	-0.5	-0.1	218	278	33.22	-0.9	0.4	132	86	21.29	-0.3	0.7
1969 - 1970	232	289	40.65	-0.7	0.9	96	98	7.42			226	195	49.57	-2.1	0.1	104	100	23.15	-1.0	0.2
1971 - 1972	147	199	5.56			63	53	9.38	-1.0	-1.3	109	125	11.41	-1.8	-0.2	72	43	1.61		
1973 - 1974	89	84	0.97			42	33	0.05			116	79	7.59			69	53	2.02		
Reference area total			99.33** (12 df)					49.21** (12 df)					257.56** (12 df)					152.43** (12 df)		
Missouri R. Basin (13)																				
1961 - 1962	156	364	4.76			55	85	0.55			100	101	34.00	3.9	0.7	63	60	2.86		
1963 - 1964	310	502	9.59	0.6	-0.2	279	314	4.28			506	405	159.73	3.6	0.6	318	224	13.19	1.1	-0.3
1965 - 1966	273	573	28.74	1.4	-0.2	349	343	1.40			402	405	120.46	3.0	0.0	260	190	3.32		
1967 - 1968	226	396	16.33	0.4	-1.2	170	195	10.92	1.8	0.8	206	222	60.10	3.3	-0.1	126	113	1.62		
1959 - 1970	136	281	0.99			74	104	6.55			229	210	59.08	3.8	0.4	171	115	12.71	1.5	0.6
1971 - 1972	229	251	5.02			87	89	0.66			335	194	68.75	3.4	1.0	210	92	2.04		
1973 - 1974	227	218	4.56			72	61	0.22			360	145	46.05	3.2	1.1	227	74	7.34		
Reference area total			69.99** (14 df)					24.58 (14 df)					548.17** (14 df)					43.08** (14 df)		
Great Lakes (14)																				
1961	64	140	1.55			93	175	7.25			158	128	35.96	0.9	-2.4	137	111	8.15		
1962	67	98	13.86	0.3	-1.3	153	242	8.53			138	118	41.84	1.4	-2.1	182	170	17.26	1.1	-0.3
1963	33	61	1.32			126	125	7.38			161	139	64.60	1.9	-1.6	194	123	8.81		
1964	37	60	0.0			92	119	2.29			245	167	46.61	2.0	-0.9	232	132	5.82		
1965	30	83	2.86			50	107	1.28			140	189	29.15	2.0	0.0	162	171	3.82		
1966	88	121	3.64			209	197	1.74			299	179	45.89	0.9	-1.9	291	134	5.90		
1967	69	99	14.03	0.4	-2.3	103	126	3.65			307	250	135.44	2.3	-2.8	249	156	11.18	1.0	-0.7
1968	65	148	9.57	1.4	0.1	116	162	4.43			310	346	78.38	1.5	-1.4	276	210	1.43		
1969	74	129	23.45	2.1	0.7	92	109	1.35			400	257	241.76	2.7	-1.9	306	199	31.09	1.4	-0.1
1970	60	99	5.38			111	84	5.81			313	142	70.50	1.6	-1.4	249	121	42.63	1.1	0.2
1971	43	57	10.81	1.3	0.3	67	58	24.66	1.6	1.9	147	81	55.43	1.6	-1.8	162	79	10.98	0.9	-0.1
1972	104	100	1.51			95	119	1.03			224	156	50.61	1.9	-2.0	179	109	3.45		
1973	68	80	0.49			88	76	6.62			317	128	53.31	2.0	-1.7	270	141	4.99		
1974	71	44	0.80			69	19				279	70	37.64	1.2	-1.9	264	68	4.21		
Reference area total			89.27** (28 df)					76.02** (26 df)					987.12** (28 df)					159.72** (28 df)		

Table B-4. Continued.

Major reference area and year group	Adult recoveries: Male ND	NI	Test	Lat	Long	Adult recoveries: Female ND	NI	Test	Lat	Long	Immature recoveries: Male ND	NI	Test	Lat	Long	Immature recoveries: Female ND	NI	Test	Lat	Long
Mid-Atlantic (15)																				
1961 - 1962	24	67	0.62			34	27	6.21			119	103	50.79	0.9	-4.5	112	65	25.37	1.0	-1.5
1963 - 1964	60	80	2.00			63	93	0.45			150	107	44.89	0.5	-3.3	128	94	15.91	0.5	-2.2
1965 - 1966	55	132	4.93			99	113	5.14			284	198	108.48	1.3	-3.7	215	165	16.49	0.0	-1.9
1967 - 1968	48	66	0.56			50	42	7.95			168	163	35.46	0.4	-4.8	115	105	14.14	1.0	-1.1
1969 - 1970	40	56	6.70			31	29	2.76			141	111	53.48	0.8	-5.6	109	64	13.27	0.7	-2.5
1971 - 1972	107	105	19.51	0.2	-1.7	78	50	8.08			190	100	76.10	0.8	-4.8	148	61	26.50	0.5	-2.7
1973 - 1974	41	22	4.96			43	15				120	34	28.98	1.0	-5.6	102	35	4.46		
Reference area total			39.28** (14 df)					30.59** (12 df)					398.18** (14 df)					116.14** (14 df)		
NE United States (16)																				
1961 - 1962	28	27	0.60			24	24	1.27			97	70	69.78	1.8	-6.4	94	58	21.36	1.5	-1.2
1963 - 1964	19	21				32	37	6.79			155	117	53.02	0.9	-4.3	142	88	8.31		
1965 - 1966	25	27	3.76			40	32	3.53			243	120	68.77	1.4	-4.4	202	103	8.26		
1967 - 1968	34	38	4.73			48	30	3.12			176	143	71.92	2.2	-4.7	162	116	10.05	0.5	-1.5
1969 - 1970	32	49	3.33			42	31	5.71			145	89	52.08	1.4	-5.2	138	69	9.33	0.4	-1.4
1971 - 1972	38	33	0.83			23	19				89	55	26.93	1.0	-5.4	89	35	2.74		
1973 - 1974	28	14				24	15				141	30	9.96	1.2	-1.9	87	28	0.20		
Reference area total			13.25 (10 df)					20.42 (10 df)					352.46** (14 df)					60.25** (14 df)		
Continental total			343.10** (30 df)					148.57** (28 df)					2554.46** (32 df)					635.15** (32 df)		

[a]The test statistic is distributed approximately as X with df = twice the number of comparisons included. Tests are not shown for sample sizes < 20 direct (ND) or indirect (NI) recoveries. Significance levels: <0.05 not indicated, ** <0.01; mean latitude-longitude differences are tabulated instead of '**'.

Table B-5. Results of testing the hypothesis that direct recovery distributions of birds banded as adults are similar to indirect recovery distributions of birds banded as immatures.

Major reference area and year group	Male NAD	Male NII	Male Test	Male Lat	Male Long	Female NAD	Female NII	Female Test	Female Lat	Female Long
N Pacific (1)										
1961 - 1974 Reference area total[a]	18	22				18	21			
N ALTA - N NWT (2)										
1961 - 1962	0	0				0	0			
1963 - 1966	80	137	1.14			25	71	0.33		
1967 - 1968	70	63	16.22	-0.9	-6.1	26	37	0.01		
1969 - 1970	27	96	3.28			22	60	10.48	4.9	1.8
1971 - 1974	77	62	4.04			40	27	1.95		
Reference area total			24.68**	(8 df)				12.77	(8 df)	
SW Alberta (3)										
1961 - 1966	60	64	0.66			21	27	0.70		
1967 - 1970	162	174	0.75			34	86	0.56		
1971 - 1974	127	50	3.73			17	27			
Reference area total			5.14	(6 df)				1.26	(4 df)	
SW Saskatchewan (4)										
1961 - 1964	132	123	1.09			32	45	2.70		
1965 - 1966	116	280	2.15			17	109			
1967 - 1968	87	101	2.64			21	40	2.01		
1969 - 1970	154	261	0.58			64	98	0.07		
1971 - 1972	276	124	1.37			62	41	7.17		
1973 - 1974	197	79	2.90			33	31	1.64		
Reference area total			10.73	(12 df)				13.59	(10 df)	
SE Saskatchewan (5)										
1961 - 1964	34	45	0.80			11	17			
1965 - 1966	75	80	9.27	1.1	-1.4	24	34	1.74		
1967 - 1968	62	57	1.91			21	19			
1969 - 1974	52	40	4.04			22	23	0.63		
Reference area total			16.02	(8 df)				2.37	(4 df)	
SW Manitoba (6)										
1961 - 1966	70	101	8.99			43	64	4.16		
1967 - 1968	134	101	14.89	1.2	-0.7	37	48	0.70		
1969 - 1970	139	187	32.71	2.3	-1.2	57	104	4.14		
1971 - 1972	199	118	14.19	0.3	-1.3	65	55	1.42		
1973 - 1974	132	71	26.81	3.1	-1.2	46	25	0.04		
Reference area total			97.59**	(10 df)				10.46	(10 df)	

Table B-5. Continued.

Major reference area and year group	Male NAD	Male NII	Male Test	Male Lat	Male Long	Female NAD	Female NII	Female Test	Female Lat	Female Long
N SASK-N MAN-W ONT (7)										
1961 - 1964	15	69				5	33			
1965 - 1968	7	70				11	25			
1969 - 1974	33	49	8.23			18	20			
Reference area total			8.23	(2 df)						
E ONT - W QUE (8)										
1961 - 1964	28	84	20.15	1.0	-4.9	40	59	17.21	1.7	-0.6
1965	48	125	40.77	1.6	-4.6	62	71	8.03		
1966	38	80	20.32	1.1	-5.0	37	78	1.22		
1967	45	105	33.12	0.8	-6.3	57	69	7.57		
1968	48	134	17.15	0.3	-4.4	38	83	7.79		
1969	64	136	40.24	1.5	-6.6	69	105	17.78	1.4	-2.4
1970	69	266	41.49	1.2	-6.3	60	167	9.25	0.4	-1.2
1971	116	361	69.95	1.0	-7.0	104	176	20.64	1.2	-2.5
1972	85	244	43.09	0.8	-5.6	57	116	2.12		
1973	68	182	23.81	0.3	-5.0	66	89	3.49		
1974	68	55	32.64	0.8	-7.7	51	34	3.54		
Reference area total			382.73**	(22 df)				98.64**	(22 df)	
Washington-Oregon (9)										
1961 - 1962	94	144	0.42			65	95	1.04		
1963 - 1964	83	122	1.55			60	72	0.69		
1965 - 1966	87	183	4.20			131	93	0.14		
1967 - 1968	63	99	10.37	-1.5	1.1	71	77	0.25		
1969 - 1970	75	123	7.74			70	92	15.44	-0.4	1.2
1971 - 1972	46	78	3.97			76	65	2.61		
1973 - 1974	63	60	2.01			48	37	0.14		
Reference area total			30.26**	(14 df)				20.31	(14 df)	
N California (10)										
1961 - 1962	46	42	2.64			30	30	1.35		
1963 - 1964	76	56	0.74			36	22	0.04		
1965 - 1966	86	58	1.00			21	17			
1967 - 1968	94	78	1.38			72	25	1.52		
1969 - 1970	79	46	2.52			49	13			
1971 - 1972	109	45	4.03			69	18			
1973 - 1974	75	57	1.82			60	21	0.05		
Reference area total			14.13	(14 df)				2.96	(8 df)	

Table B-5. Continued.

Major reference area and year group	Male NAD	Male NII	Male Test	Male Lat	Male Long	Female NAD	Female NII	Female Test	Female Lat	Female Long
Intermountain (11)										
1961 - 1962	119	103	5.17			63	57	0.49		
1963 - 1964	129	188	9.23	-0.9	-0.1	65	69	4.20		
1965 - 1966	161	239	6.94			98	117	1.12		
1967 - 1968	86	90	14.25	1.2	-1.9	55	32	3.08		
1969 - 1970	55	75	11.45	0.3	-0.9	18	43			
1971 - 1974	47	50	6.99			33	21	1.49		
Reference area total			54.03**	(12 df)				10.38	(10 df)	
High Plains (12)										
1961 - 1964	164	174	4.66			86	63	9.61	-1.6	0.5
1965 - 1966	218	270	0.09			114	121	14.32	-1.2	-0.4
1967 - 1968	208	278	3.38			118	86	0.51		
1969 - 1970	232	195	23.32	-1.7	0.0	96	100	13.40	-1.5	0.0
1971 - 1972	147	125	2.45			63	43	6.56		
1973 - 1974	89	79	1.57			42	53	0.98		
Reference area total			35.47**	(12 df)				45.38**	(12 df)	
Missouri R. Basin (13)										
1961 - 1962	156	101	3.31			55	60	2.77		
1963 - 1964	310	405	6.10			279	224	1.48		
1965 - 1966	273	405	16.37	0.7	-0.9	249	190	6.09		
1967 - 1968	226	222	15.71	0.7	-1.4	170	113	0.67		
1969 - 1970	136	210	0.07			74	115	3.34		
1971 - 1972	229	194	5.64			87	92	0.40		
1973 - 1974	227	145	5.28			72	74	2.60		
Reference area total			52.48**	(14 df)				17.35	(14 df)	
Great Lakes (14)										
1961	64	128	29.90	-0.9	-4.0	93	111	0.35		
1962	67	118	24.60	0.8	-2.2	153	170	27.65	0.6	-0.5
1963	33	139	5.61			126	123	10.38	0.8	0.4
1964	37	167	10.82	-0.9	-2.8	92	132	0.09		
1965	30	189	6.77			50	171	4.90		
1966	88	179	24.57	-1.6	-4.3	209	134	0.31		
1967	69	250	40.17	0.9	-4.3	103	156	1.18		
1968	65	346	16.74	1.0	-2.2	116	210	8.62		
1969	74	257	41.01	1.3	-3.0	92	199	8.60		
1970	60	142	23.83	-0.4	-5.0	111	121	6.22		
1971	43	81	22.84	0.2	-4.7	67	79	7.01		
1972	104	156	26.91	0.7	-4.3	95	109	1.86		
1973	68	128	31.30	0.0	-3.9	88	141	17.23	-2.3	-2.3
1974	71	70	13.39	-1.7	-3.6	69	68	4.97		
Reference area total			318.46**	(28 df)				99.37**	(28 df)	

Table B-5. Continued.

Major reference area and year group	Male NAD	Male NII	Male Test	Male Lat	Male Long	Female NAD	Female NII	Female Test	Female Lat	Female Long
Mid-Atlantic (15)										
1961 - 1962	24	103	17.78	-1.8	-4.8	34	65	10.24	0.3	-3.0
1963 - 1964	60	107	15.22	-1.3	-3.7	63	94	5.14		
1965 - 1966	55	198	25.52	0.2	-4.2	99	165	23.11	-1.0	-2.5
1967 - 1968	48	163	27.53	-1.0	-5.0	50	105	8.22		
1969 - 1970	40	111	30.84	-0.4	-4.3	31	64	5.36		
1971 - 1972	107	100	56.97	-0.3	-4.6	78	61	19.41	-0.1	-2.5
1973 - 1974	41	34	24.13	0.7	-5.0	43	35	11.07	0.1	-0.6
Reference area total			197.99** (14 df)					82.55** (14 df)		
NE United States (16)										
1961 - 1962	28	70	17.55	0.5	-6.3	24	58	5.80		
1963 - 1964	19	117				32	88	6.17		
1965 - 1966	25	120	10.45	-0.8	-4.0	40	103	2.62		
1967 - 1968	34	143	25.60	1.9	-6.0	48	116	8.94		
1969 - 1970	32	89	11.19	0.7	-5.2	42	69	5.68		
1971 - 1972	38	55	2.00			23	35	0.03		
1973 - 1974	28	30	2.56			24	28	1.44		
Reference area total			69.35** (12 df)					30.68** (14 df)		
Continental total			924.18** (30 df)					196.47** (28 df)		

[a]The test statistic is distributed approximately as X with df = twice the number of comparisons included. Test are not shown for sample sizes < 20 adult direct (NAD) or immature indirect (NII) recoveries. Significance levels: <0.05 not indicated, ** <0.01; mean latitude-longitude differences are tabulated instead of '**'.

Table B-6. Results of testing the hypothesis that direct recovery distributions of mallards are similar during consecutive years or groups of years.

Major reference area and year group	Adult recoveries										Immature recoveries									
	Male					Female					Male					Female				
	N1	N2	Test	Lat	Long	N1	N2	Test	Lat	Long	N1	N2	Test	Lat	Long	N1	N2	Test	Lat	Long
N ALTA - N NWT (2)																				
1963-64 vs 1965-66	22	58	0.10			8	17				33	104	3.81			28	57	3.80		
1967-68 vs 1969-70	70	27	1.99			26	22	2.74			65	105	0.84			48	97	0.23		
1971-72 vs 1973-75	48	42	3.85			33	9				49	30	15.96	4.3	8.0	48	18			
Reference area total[a]			5.94	(6 df)				2.74	(2 df)				20.61**	(6 df)				4.03	(4 df)	
SW Alberta (3)																				
1961-66 vs 1967-70	60	162	0.38			21	34	0.26			61	148	0.11			28	79	1.13		
1971-72 vs 1973-75	116	27	0.87			15	6				46	36	4.16			28	19			
Reference area total			1.25	(4 df)				0.26	(2 df)				4.27	(4 df)				1.13	(2 df)	
SW Saskatchewan (4)																				
1961-62 vs 1963-64	35	97	10.67	0.9	4.9	3	29				8	78				5	48			
1965-66 vs 1967-68	116	87	6.35			17	21				122	39	0.49			116	30	1.13		
1969-70 vs 1971-72	154	276	5.26			64	62	1.66			120	182	17.05	-2.6	-3.1	108	93	6.56		
1973-74 vs 1975	197	46	8.29			33	16				141	68	1.65			80	32	0.87		
Reference area total			30.57**	(8 df)				1.66	(2 df)				19.19**	(6 df)				8.56	(6 df)	
SE Saskatchewan (5)																				
1961-64 vs 1965-66	34	75	6.01			11	24				36	62	18.89	7.7	6.5	22	31	1.24		
1967-68 vs 1969-75	62	150	8.69			21	37	0.72			46	74	3.95			25	51	3.08		
Reference area total			14.70**	(4 df)				0.72	(2 df)				22.84**	(4 df)				4.32	(4 df)	
SW Manitoba (6)																				
1961-66 vs 1967-68	70	134	2.74			43	37	3.92			168	87	20.98	1.6	0.2	108	47	7.74		
1969-70 vs 1971-72	139	199	4.16			57	65	0.73			179	129	5.33			94	95	5.00		
1973-74 vs 1975	132	112	10.10	3.0	0.6	46	30	6.76			129	102	25.31	-1.7	0.3	78	49	5.21		
Reference area total			17.00**	(6 df)				11.41	(6 df)				51.62**	(6 df)				17.95**	(6 df)	
N SASK- N MAN- W ONT (7)																				
1961-64 vs 1965-68	15	7				5	11				62	56	4.44			63	45	0.71		
1969-70 vs 1971-75	3	31				0	19				20	112	20.13	-0.9	-4.4	11	78			
Reference area total													24.57**	(4 df)				0.71	(2 df)	
E ONT - W QUE (8)																				
1961-64 vs 1965	28	48	0.29			40	62	3.32			127	148	28.91	-0.3	-0.1	136	154	40.15	-0.4	-1.3
1966 vs 1967	38	45	2.90			37	57	1.45			182	175	1.83			117	130	5.23		
1968 vs 1969	48	64	4.17			38	69	1.75			242	261	7.96			222	198	22.85	0.1	0.6
1970 vs 1971	69	116	5.51			60	104	3.10			446	473	6.68			337	320	1.19		
1972 vs 1973	85	68	0.05			57	66	1.81			471	330	12.11	-0.4	0.7	317	199	6.60		
1974 vs 1975	68	60	3.53			51	54	1.61			193	184	8.45			98	130	0.54		
Reference area total			16.45	(12 df)				13.04	(12 df)				65.94**	(12 df)				76.56**	(12 df)	

Table B-6. Continued.

Major reference area and year group	Adult recoveries: Male N1	N2	Test	Lat	Long	Adult recoveries: Female N1	N2	Test	Lat	Long	Immature recoveries: Male N1	N2	Test	Lat	Long	Immature recoveries: Female N1	N2	Test	Lat	Long
Washington-Oregon (9)																				
1961-62 vs 1963-64	94	83	6.22			65	60	0.77			261	289	4.19			153	252	2.87		
1965-66 vs 1967-68	87	63	3.09			131	71	9.28	-0.2	-0.8	266	212	6.19			226	115	2.10		
1969-70 vs 1971-72	75	46	1.86			70	76	12.35	-0.6	0.7	212	164	19.40	-1.3	-0.2	164	128	4.36		
1973 vs 1974	26	37	1.37			31	17				112	113	2.40			68	57	0.03		
Reference area total			12.54 (8 df)					22.40** (6 df)					32.18** (8 df)					9.36 (8 df)		
N California (10)																				
1961-62 vs 1963-64	46	76	1.03			30	36	1.59			85	48	8.92			34	32	14.16	-2.7	-0.3
1965-66 vs 1967-68	86	94	5.14			21	72	0.83			80	130	59.54	1.1	1.0	57	60	33.30	0.6	1.3
1969-70 vs 1971-72	79	109	4.11			49	69	18.57	0.4	-1.1	75	117	28.60	1.2	0.0	22	50	4.51		
1973-74 vs 1975	75	62	1.59			60	26	0.40			107	43	11.32	-0.9	0.1	53	15			
Reference area total			11.87 (8 df)					21.39** (8 df)					108.38** (8 df)					51.97** (6 df)		
Intermountain (11)																				
1961-62 vs 1963-64	119	129	17.91	1.3	0.5	63	65	4.17			97	164	4.68			74	98	0.60		
1965-66 vs 1967-68	161	86	1.51			98	55	24.32	2.9	0.2	242	116	60.69	3.0	-1.3	130	56	28.45	3.0	0.4
1969-70 vs 1971-75	55	56	7.59			18	40				80	99	23.48	2.1	-0.4	44	42	2.24		
Reference area total			27.01** (6 df)					28.49** (4 df)					88.85** (6 df)					31.29** (6 df)		
High Plains (12)																				
1961-62 vs 1963-64	18	146				5	81				10	128				5	78			
1965-66 vs 1967-68	218	208	1.26			114	118	16.29	-0.2	0.5	235	218	31.87	-0.1	0.2	168	132	33.33	-0.4	0.1
1969-70 vs 1971-72	232	147	82.02	-1.1	2.0	96	63	42.76	-1.5	2.4	226	109	45.48	-0.4	1.4	104	72	44.33	-1.1	0.7
1973-74 vs 1975	89	61	2.10			42	34	0.86			116	85	2.60			69	39	2.76		
Reference area total			85.38** (6 df)					59.91** (6 df)					79.95** (6 df)					80.42** (6 df)		
Missouri R. Basin (13)																				
1961-62 vs 1963-64	156	310	0.32			55	279	0.08			100	506	13.09	-0.5	0.5	63	318	0.13		
1965-66 vs 1967-68	273	226	0.14			249	170	3.37			402	206	0.47			260	126	1.33		
1969-70 vs 1971-72	136	229	11.05	0.4	2.4	74	87	0.97			229	335	3.61			171	210	14.60	1.5	0.6
1973-74 vs 1975	227	91	9.38	1.0	1.9	72	74	1.38			360	169	4.96			227	137	3.35		
Reference area total			20.89** (8 df)					5.80 (8 df)					22.13** (8 df)					19.41 (8 df)		
Great Lakes (14)																				
1961 vs 1962	64	67	3.88			93	153	16.04	-1.7	-1.4	158	138	0.79			137	182	1.93		
1963 vs 1964	33	37	1.34			126	92	10.97	0.3	-0.3	161	245	12.57	-0.2	-1.9	194	232	3.03		
1965 vs 1966	30	88	1.24			50	209	11.16	-0.4	0.7	140	299	10.99	0.3	1.1	162	291	7.63		
1967 vs 1968	69	65	0.42			103	116	9.21	0.4	1.5	307	310	9.30	0.5	-0.7	249	276	4.11		
1969 vs 1970	74	60	1.44			92	111	0.88			400	313	89.42	0.2	-1.9	306	249	11.24	-0.1	-1.0
1971 vs 1972	43	104	7.02			67	95	15.82	0.1	1.9	147	224	52.12	1.1	1.7	162	179	25.79	0.7	1.5
1973 vs 1974	68	71	10.00	-0.1	-1.5	88	69	25.85	-2.0	-2.4	317	279	33.89	-1.0	-1.1	270	264	36.73	-0.8	-1.2
Reference area total			25.34 (14 df)					89.93** (14 df)					209.08** (14 df)					90.46** (14 df)		

Table B-6. Continued.

Major reference area and year group	Adult recoveries										Immature recoveries									
	Male					Female					Male					Female				
	N1	N2	Test	Lat	Long	N1	N2	Test	Lat	Long	N1	N2	Test	Lat	Long	N1	N2	Test	Lat	Long
Mid-Atlantic (15)																				
1961-62 vs 1963-64	24	60	2.02			34	63	12.99	1.5	-1.4	119	150	13.04	0.4	-0.9	112	128	13.96	0.8	0.0
1965-66 vs 1967-68	55	48	12.04	0.5	-0.9	99	50	13.55	-0.8	-0.9	284	168	15.79	0.2	-0.6	215	115	5.23		
1969-70 vs 1971-72	40	107	2.62			31	78	0.14			141	190	14.18	-0.3	-0.7	109	148	7.22		
1973-74 vs 1975	41	30	8.11			43	39	17.37	1.3	0.2	120	73	3.19			102	51	16.03	-0.5	1.8
Reference area total			24.79**	(8 df)				44.05**	(8 df)				46.20**	(8 df)				42.44**	(8 df)	
NE United States (16)																				
1961-62 vs 1963-64	28	19				24	32	1.27			97	155	6.16			94	142	4.80		
1965-66 vs 1967-68	25	34	7.31			40	48	2.39			243	176	4.57			202	162	2.68		
1969-70 vs 1971-72	32	38	4.16			42	23	2.75			145	89	7.16			138	89	1.65		
1973-74 vs 1975	28	9				24	17				141	61	8.81			87	64	9.80	-0.7	-0.3
Reference area total			11.47	(4 df)				6.41	(6 df)				26.70**	(8 df)				18.93	(8 df)	
Continental total			176.98**	(28 df)				195.74**	(28 df)				612.49**	(30 df)				301.36**	(30 df)	

[a]The test statistic is distributed approximately as X with df = twice the number of comparisons included. Tests are not shown for sample sizes < 20 year-group 1 (N1) or year-group 2 (N2) recoveries. Significance levels: <0.05 not indicated, ** <0.01; mean latitude-longitude differences are tabulated instead of '**'.

Table B-7. Results of testing the hypothesis that mallards banded during consecutive years or groups of years have similar indirect recovery distributions.

Major reference area and year group	Adult recoveries: Male N1	N2	Test	Lat	Long	Adult recoveries: Female N1	N2	Test	Lat	Long	Immature recoveries: Male N1	N2	Test	Lat	Long	Immature recoveries: Female N1	N2	Test	Lat	Long
N ALTA - N NWT (2)																				
1963-64 vs 1965-66	35	82	2.96			9	28				35	102	8.17			15	56			
1967-68 vs 1969-70	149	61	3.14			37	25	2.72			63	96	1.22			37	60	4.95		
1971-72 vs 1973-74	51	24	6.36			22	6				50	12				19	8			
Reference area total[a]			12.46	(6 df)				2.72	(2 df)				9.39	(4 df)				4.95	(2 df)	
SW Alberta (3)																				
1961-66 vs 1967-70	123	403	6.99			21	67	0.03			64	174	3.33			27	86	0.64		
1971-72 vs 1973-74	130	12				26	3				42	8				26	1			
Reference area total			6.99	(2 df)				0.03	(2 df)				3.33	(2 df)				0.64	(2 df)	
SW Saskatchewan (4)																				
1961-62 vs 1963-64	89	190	12.07	1.3	2.9	5	30				18	105				8	37			
1965-66 vs 1967-68	305	296	2.03			46	43	0.15			280	101	2.62			109	40	0.09		
1969-70 vs 1971-72	338	356	12.36	-0.2	-1.6	57	66	1.44			261	124	2.40			98	41	1.94		
1973 vs 1974	108	60	1.33			18	16				31	48	0.80			6	25			
Reference area total			27.79**	(8 df)				1.59	(4 df)				5.82	(6 df)				2.03	(4 df)	
SE Saskatchewan (5)																				
1961-64 vs 1965-66	41	137	3.68			13	24				45	80	6.61			17	34			
1967-68 vs 1969-74	230	89	0.71			36	11				57	40	0.64			19	23			
Reference area total			4.39	(4 df)									7.25	(4 df)						
SW Manitoba (6)																				
1961-66 vs 1967-68	135	264	8.71			26	45	0.58			101	101	2.25			64	48	1.31		
1969-70 vs 1971-72	219	236	1.07			72	33	1.30			187	118	4.15			104	55	11.89	-1.6	-2.4
1973 vs 1974	58	33	2.45			21	5				39	32	1.70			16	9			
Reference area total			12.23	(6 df)				1.88	(4 df)				8.10	(6 df)				13.20	(4 df)	
N SASK-N MAN-W ONT (7)																				
1961-64 vs 1965-68	30	18				7	8				69	70	4.26			33	25	1.35		
1969-70 vs 1971-74	6	28				4	12				26	23	14.54	0.5	-4.3	7	13			
Reference area total													18.80**	(4 df)				1.35	(2 df)	
E ONT - W QUE (8)																				
1961-64 vs 1965	24	62	2.35			27	56	7.46			84	125	1.63			59	71	14.87	-1.8	-1.6
1966 vs 1967	28	65	0.75			47	38	1.36			80	105	4.46			78	69	3.88		
1968 vs 1969	45	65	3.39			49	53	4.14			134	136	5.14			83	105	3.17		
1970 vs 1971	77	127	5.90			69	90	0.76			266	361	1.71			167	176	5.15		
1972 vs 1973	76	58	1.52			41	50	4.85			244	182	4.38			116	89	0.71		
Reference area total			13.91	(10 df)				18.57	(10 df)				17.32	(10 df)				27.78**	(10 df)	

Table B-7. Continued.

Major reference area and year group	Adult recoveries										Immature recoveries									
	Male					Female					Male					Female				
	N1	N2	Test	Lat	Long	N1	N2	Test	Lat	Long	N1	N2	Test	Lat	Long	N1	N2	Test	Lat	Long
Washington-Oregon (9)																				
1961-62 vs 1963-64	168	98	13.18	-1.0	-0.7	66	50	1.48			144	122	1.02			95	72	2.36		
1965-66 vs 1967-68	118	70	1.38			116	73	19.48	0.4	-1.3	183	99	3.70			93	77	11.89	-0.6	-1.2
1969-70 vs 1971-72	96	46	1.06			59	64	17.79	-1.1	1.1	123	78	0.18			92	65	4.86		
1973 vs 1974	28	17				7	8				36	24	3.18			15	22			
Reference area total			15.62	(6 df)				38.75**	(6 df)				8.08	(8 df)				19.11**	(6 df)	
N California (10)																				
1961-62 vs 1963-64	97	115	6.35			27	34	4.07			42	56	3.33			30	22	7.79		
1965-66 vs 1967-68	119	128	0.90			27	66	0.38			58	78	2.04			17	25			
1969-70 vs 1971-72	108	90	0.40			48	40	0.07			46	45	0.32			13	18			
1973 vs 1974	49	17				16	11				44	13				21	0			
Reference area total			7.65	(6 df)				4.52	(6 df)				5.69	(6 df)				7.79	(2 df)	
Intermountain (11)																				
1961-62 vs 1963-64	175	216	19.98	-0.5	1.1	71	66	2.15			103	188	3.90			57	69	2.89		
1965-66 vs 1967-68	238	126	3.60			123	37	1.05			239	90	30.12	2.0	-1.4	117	32	23.52	3.0	-1.0
1969-70 vs 1971-74	68	49	0.42			16	36				75	50	4.17			43	21	4.77		
Reference area total			24.00**	(6 df)				3.20	(4 df)				38.19**	(6 df)				31.18**	(6 df)	
High Plains (12)																				
1961-62 vs 1963-64	60	295	12.74	1.7	-1.9	12	79				23	151	16.80	3.5	-1.5	8	55			
1965-66 vs 1967-68	496	421	8.37			97	151	6.69			270	278	1.32			121	86	2.71		
1969-70 vs 1971-72	289	199	39.92	-0.9	1.9	98	53	35.73	-1.6	1.1	195	125	14.00	-0.1	1.0	100	43	14.04	-0.9	0.8
1973 vs 1974	47	37	3.08			22	11				45	34	0.04			29	24	1.01		
Reference area total			64.11**	(8 df)				42.42**	(4 df)				32.16**	(8 df)				17.76**	(6 df)	
Missouri R. Basin (13)																				
1961-62 vs 1963-64	364	502	0.41			85	314	0.26			101	405	4.12			60	224	4.90		
1965-66 vs 1967-68	573	396	7.38			343	195	2.89			405	222	1.99			190	113	1.22		
1969-70 vs 1971-72	281	251	9.32	0.6	1.6	104	89	10.62	0.1	2.0	210	194	4.66			115	92	0.10		
1973 vs 1974	128	90	1.75			34	27	6.09			101	44	0.68			43	31	2.51		
Reference area total			18.86	(8 df)				19.86	(8 df)				11.45	(8 df)				8.73	(8 df)	
Great Lakes (14)																				
1961 vs 1962	140	98	0.93			175	242	2.32			128	118	0.40			111	170	7.70		
1963 vs 1964	61	60	2.00			125	119	5.36			139	167	7.34			123	132	3.75		
1965 vs 1966	83	121	0.26			107	197	3.09			189	179	0.81			171	134	0.76		
1967 vs 1968	99	148	5.68			126	162	1.30			250	346	5.33			156	210	2.33		
1969 vs 1970	129	99	1.30			109	84	0.22			257	142	8.21			199	121	5.12		
1971 vs 1972	57	100	0.83			58	119	1.10			81	156	5.81			79	109	1.02		
1973 vs 1974	80	44	2.47			76	19				128	70	7.49			141	68	1.36		
Reference area total			13.47	(14 df)				13.39	(12 df)				35.39**	(14 df)				22.04	(14 df)	

Table B-7. Continued.

Major reference area and year group	Adult recoveries										Immature recoveries									
	Male					Female					Male					Female				
	N1	N2	Test	Lat	Long	N1	N2	Test	Lat	Long	N1	N2	Test	Lat	Long	N1	N2	Test	Lat	Long
Mid-Atlantic (15)																				
1961-62 vs 1963-64	67	80	9.16			27	93	4.37			103	107	1.20			65	94	6.53		
1965-66 vs 1967-68	132	66	1.33			113	42	3.17			198	163	2.62			165	105	3.82		
1969-70 vs 1971-72	56	105	0.35			29	50	0.04			111	100	0.10			64	61	3.98		
1973 vs 1974	16	6				6	9				23	11				27	8			
Reference area total			10.84	(6 df)				7.58	(6 df)				3.92	(6 df)				14.33	(6 df)	
NE United States (16)																				
1961-62 vs 1963-64	27	21	0.60			24	37	0.97			70	117	5.88			58	88	3.77		
1965-66 vs 1967-68	27	38	7.97			32	30	0.34			120	143	5.36			103	116	0.07		
1969-70 vs 1971-72	49	33	1.90			31	19				89	55	0.12			69	35	0.52		
1973 vs 1974	5	9				7	8				17	13				15	13			
Reference area total			10.47	(6 df)				1.31	(4 df)				11.36	(6 df)				4.36	(6 df)	
Continental total			130.97**	(28 df)				90.57**	(26 df)				109.62**	(30 df)				94.65**	(28 df)	

[a]The test statistic is distributed approximately as X with df = twice the number of comparisons included. Tests are not shown for sample sizes < 20 year-group 1 (N1) or year-group 2 (N2) recoveries. Significance levels: <0.05 not indicated, ** <0.01; mean latitude-longitude differences are tabulated instead of '**'.

Appendix C

Inferences Regarding Variation in Recovery Dates

Recovery dates were shown to vary with time since banding. Such variation might indicate that survival or recovery rates, or both, change as a function of number of years after banding. If such variation exists, then it reflects an important deviation from assumptions of models generally used to estimate migratory bird survival and recovery rates. Here we examine the effects of such variation on estimates of survival and recovery rates obtained under the Seber–Robson–Youngs model (Model 1 of Brownie et al. 1978).

For a 3-year banding experiment, the structure of the band recovery matrix under Model 1 is

Year banded	Number banded	Expected number recovered by year 1	2	3
1	N_1	N_1f_1	$N_1S_1f_2$	$N_1S_1S_2f_3$
2	N_2		N_2f_2	$N_2S_2f_3$
3	N_3			N_3f_3

where N_i denotes the number of birds banded in year i, and S_i and f_i are the survival and recovery rates for year i. Under this model, recovery and survival rates are specific only to calendar year of recovery.

One way to specify the structure of the recovery matrix under an alternative model is

Year banded	Number banded	Expected number recovered by year 1	2	3
1	N_1	$N_1(a_1f_1)$	$N_1(b_1S_1)(a_2f_2)$	$N_1(b_1S_1)(b_2S_2)(a_3f_3)$
2	N_2		$N_2(a_1f_2)$	$N_2(b_1S_2)(a_2f_3)$
3	N_3			$N_3(a_1f_3)$

where a_j specifies a change in recovery rate associated with the jth year after banding, and b_j specifies a change in survival probability. For example, the recovery rate for birds banded in year 1 and recovered in year 2 (a_2f_2) is not necessarily the same as that for birds banded and recovered in year 2 (a_1f_2).

In the following results it was convenient to let the survival (b_j) and recovery rate coefficients (a_j) take initial values of 1.0 and then increase or decrease annually by a constant amount, Δ. For example,

$$\Delta a = 0.0 \text{ implies } a_1 = 1.0, a_2 = 1.0, \ldots a_7 = 1.0;$$
$$\Delta a = 0.1 \text{ implies } a_1 = 1.0, a_2 = 1.1, \ldots a_7 = 1.6;$$
$$\Delta a = -0.1 \text{ implies } a_1 = 1.0, a_2 = 0.9, \ldots a_7 = 0.4.$$

Thus, if all f_i and S_i remain constant (i.e., $f_i = f^*$, $S_i = S^*$ for all i), positive values of Δ correspond to rates that increase with number of years after banding, whereas negative values correspond to decreasing rates.

The objective of this work was to estimate or approximate the bias in estimates of S and f (obtained assuming Model 1) if survival or recovery probabilities, or both, increase or decrease with time since banding. Two methods were used to examine bias. The first method involved use of a computer simulation model in which recovery matrices were generated from a multinomial distribution with cell probabilities defined by f_i, S_i, a_j, and b_j. Model 1 estimates were computed for each of a number (e.g., 200) of recovery matrices generated using the same parameter values. Mean squared error and sample variance were then computed for each $\hat{S}_i$ and $\hat{f}_i$ from the 200 iterations, and squared bias was estimated as the difference between these two values. Monte Carlo simulations were also used to examine coverage of the estimated confidence intervals and power of the Model 1 goodness-of-fit test of Brownie et al. (1978).

Confidence intervals were estimated from parameter and variance estimates for each iteration, and the proportion of iterations in which these intervals covered the true parameter was recorded. A goodness-of-fit test statistic was also computed based on the data and parameter estimates of each iteration, and the proportion of iterations in which Model 1 was rejected ($P < 0.05$) was recorded. The other approach was to approximate bias by computing the first term in Taylor series expansions of the estimators of S_i and f_i (Brownie et al. 1978:16) about the expected values of R_i, C_i, and T_i (the row, column, and block totals of the recovery matrix, Brownie et al. 1978). The difference between this approximation to the expected value of the estimator and the true parameter value represented an approximation of the bias. Monte Carlo simulations suggested this approximation was good, because the higher order terms in the Taylor series expansion apparently were not large for the situations examined.

Both methods of investigating bias naturally require knowledge of the "true" value of the parameter being estimated, which was not entirely obvious. For example, there are two recovery rates for year 2. Birds banded in year 1 are recovered with probability a_2f_2, whereas birds banded in year 2 are recovered with probability a_1f_2. One approach is to simply take the arithmetic mean of the recovery (or survival) rates for a given calendar year. Another approach is to obtain a mean of rates weighted by the number of birds expected to be alive at the beginning of the interval for which the rates are expected to pertain. A general equation for the weighted average recovery rate is:

$$\bar{f}_x = \frac{\sum_{i=1}^{x} \left\{ N_i \begin{bmatrix} 1 \text{ if } x \le i \\ \text{or} \\ \prod_{j=i}^{x-1} S_j \end{bmatrix} \begin{bmatrix} 1 \text{ if } x \le i \\ \text{or} \\ \prod_{j=1}^{x-i} b_j \end{bmatrix} [f_x a_{x-i+1}] \right\}}{\sum_{i=1}^{x} \left\{ N_i \begin{bmatrix} 1 \text{ if } x \le i \\ \text{or} \\ \prod_{j=i}^{x-1} S_j \end{bmatrix} \begin{bmatrix} 1 \text{ if } x \le i \\ \text{or} \\ \prod_{j=1}^{x-i} b_j \end{bmatrix} \right\}}$$

A similar expression for $\bar{S}_x$ is obtained by substituting $[S_x\ b_{x-i+1}]$ for $[f_x\ a_{x-i+1}]$ in the numerator.

Both methods of approximating bias are quite flexible and could have been used to examine a wide variety of situations. However, it seemed appropriate to standardize as many variables as possible for comparative purposes. Unless otherwise specified, all runs used 7 years of banding with all $N_i = 1{,}000$, $S_i = 0.60$, and $f_i = 0.10$ ($i = 1, 2, \ldots 7$). Taylor series approximations were used, except where noted. Both methods of computing "true" parameters were used. In some instances the true values were not ambiguous (e.g., when all $\Delta b_i = 0$). Both approaches showed the same direction of bias, but the bias using weighted mean true values was usually smaller. We have condensed the presentation of results by including only weighted mean true values.

Effects of Recovery Rate Variation ($\Delta a \neq 0$)

Whereas the expected value of $\hat{f}_i$ (denoted $E(\hat{f}_i)$) remained unchanged for $\Delta a \neq 0$ in each of 7 years, the true recovery rate (f_i) after year 1 deviated further from $E(\hat{f}_i)$ each year in accordance with the sign and magnitude of Δa (Fig. C-1). The increment of deviation, however, decreased annually after year 2. Confidence interval coverage of f_i when $\Delta a > 0$ is shown in Fig. C-2, where each point represents results of 200 iterations with the simulation model. When $\Delta a > 0$, f_i fell outside of the confidence interval of $\hat{f}_i$ more frequently with the passage of time. A plot of $\Delta a < 0$ (not shown) gave nearly identical results.

Taylor series approximations of the effect of $\Delta a \neq 0$ on survival rate estimates (Fig. C-3) indicated $\hat{S}_i$ was biased for all years in accordance with the sign and magnitude of Δa. Confidence interval coverage of the true survival rate (S_i) when $\Delta a > 0$ (Fig. C-4) indicated that, for most values of Δa, S_i fell within the 95% confidence interval of $\hat{S}_i$ approximately 85–95% of the time.

The ability of the goodness-of-fit test to reject the hypothesis that the data fit Model 1 when $\Delta a \neq 0$ is shown in Fig. C-5 (dashed line). The power is estimated as the proportion of the 200 Monte Carlo iterations in which Model 1 was rejected at the 95% confidence level. For all values of Δa, the goodness-of-fit test accepted the hypothesis that the data fitted Model 1 approximately 95% of the time. Variation in recovery rates was thus virtually undetectable in the situations examined.

Effects of Survival Rate Variation ($\Delta b \neq 0$)

When we examined $\Delta b \neq 0$, $E(\hat{f}_i)$ deviated from f_i in all but the first and last years (Fig. C-6). The deviation was symmetrical among years and greatest in the middle year of the series. The sign of the bias was opposite the sign of Δb and varied with the magnitude of Δb. Confidence interval coverage of f_i when $\Delta b > 0$ (Fig. C-7) was poorest for the middle years of the series and for the higher values of Δb.

Figures C-8 and C-9 compare $E(\hat{S}_i)$ and S_i when $\Delta b \neq 0$. The bias of $\hat{S}_i$ was of the same sign as Δb, greatest in the initial estimate, decreased through the years, but reversed itself near the end of the series. The pattern remained much the same with 6 additional years of banding (Fig. C-10). Confidence interval coverage of S_i when $\Delta b > 0$ (Fig. C-11) was poorest in the initial year of estimation and improved annually except for the last year of the series.

Power of the Model 1 goodness-of-fit test when $\Delta b \neq 0$ (solid line in Fig. C-5) was considerably >0.05 for large Δb. The power curve was asymmetric with greater power for $\Delta b > 0$. Thus, unlike variations in recovery rate, survival rates with appreciable variation appeared likely to result in rejection of Model 1.

In summary, if survival rates appreciably varied as a function of years after banding, rejection of Model 1 is likely. Although rejection is unlikely for an appreciable variation of recovery rates, it is difficult to hypothesize a specific directional effect of a relationship between recovery dates and recovery rates. For example, early recovery dates might relate to greater vulnerability to hunting, hence higher observed recovery rates. Conversely, assuming a relationship between recovery date and geographic area, early recovery dates might relate to recovery in an area of lower reporting rates (nearer the banding site), hence lower observed recovery rates. If both of the above hypotheses are correct, the biases would be offsetting. Also, we believe that the ratio of recovery rate bias to standard error would be very low. In other words, if a bias exists we expect it to be of little importance compared to sampling variation.

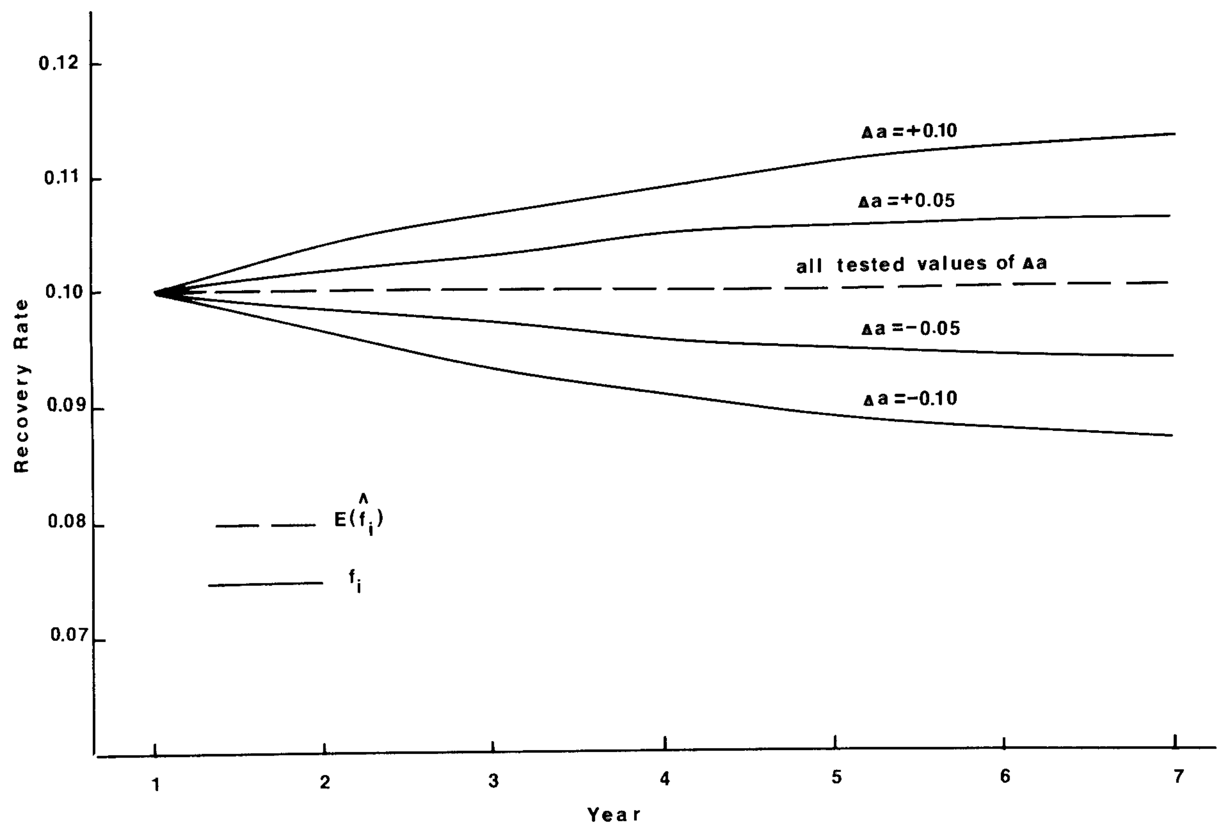

Fig. C-1. $E(\hat{f}_i)$ and true f_i for selected Δa.

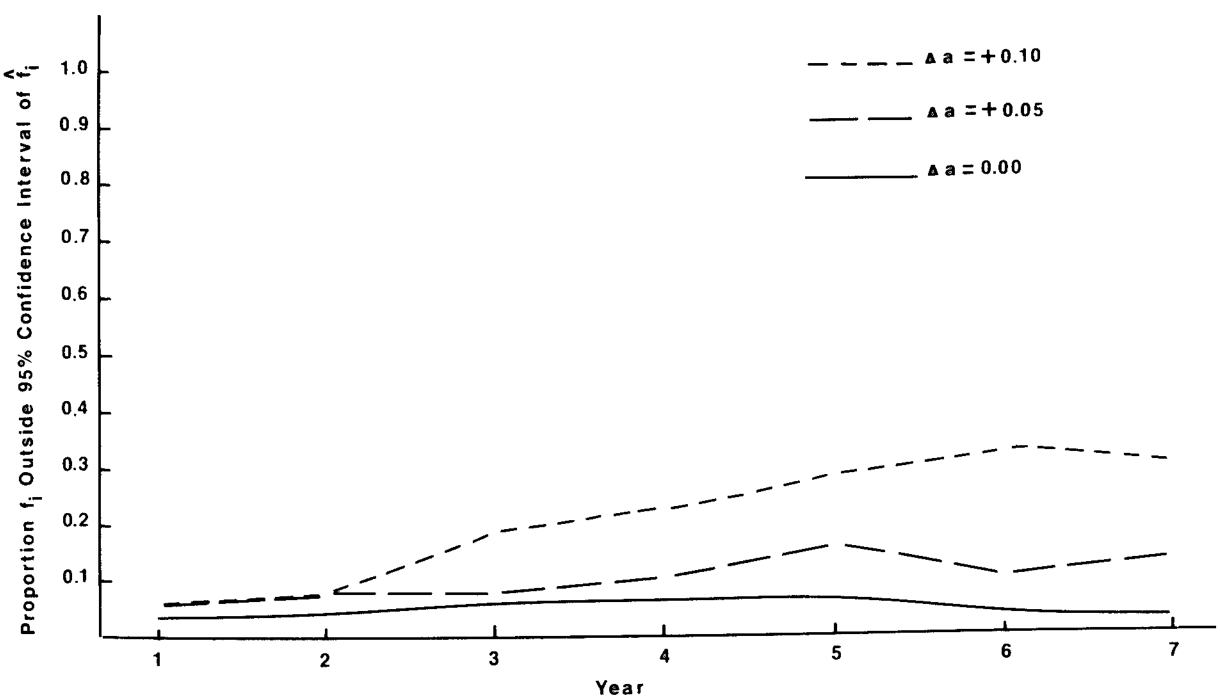

Fig. C-2. Confidence interval coverage of the true recovery rate (f_i) for selected Δa.

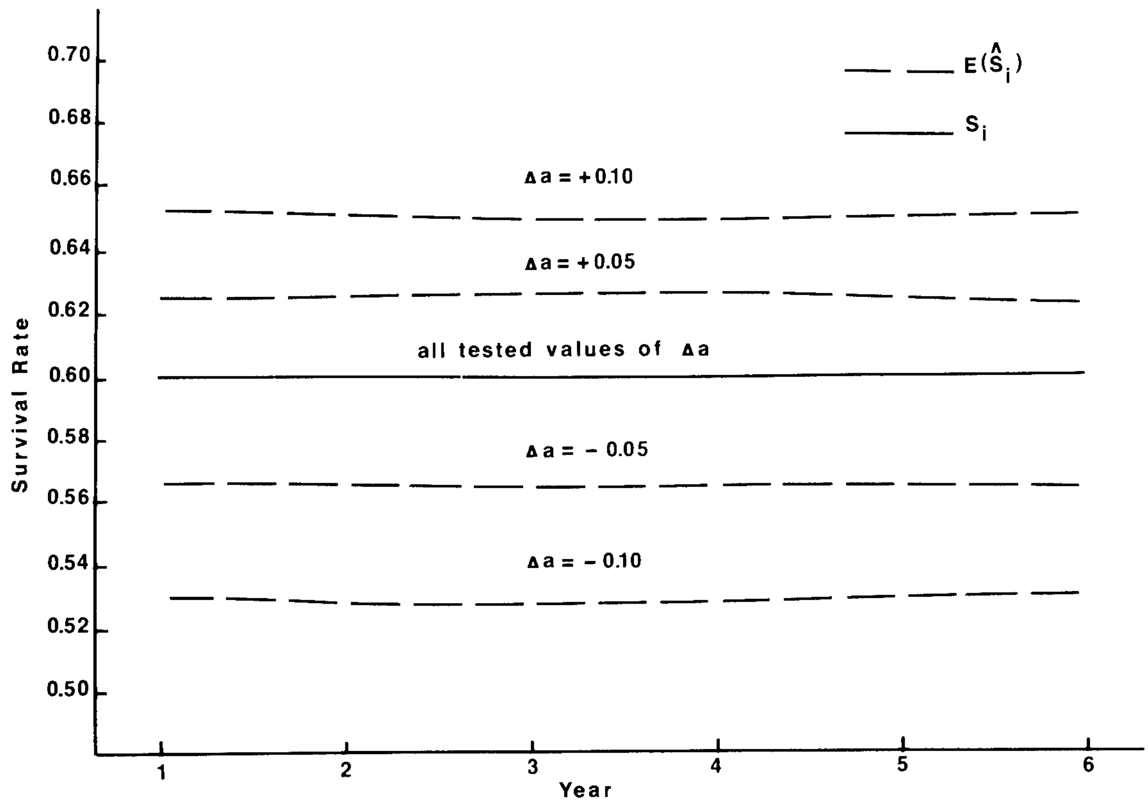

Fig. C-3. $E(\hat{S}_i)$ and true S_i for selected Δa.

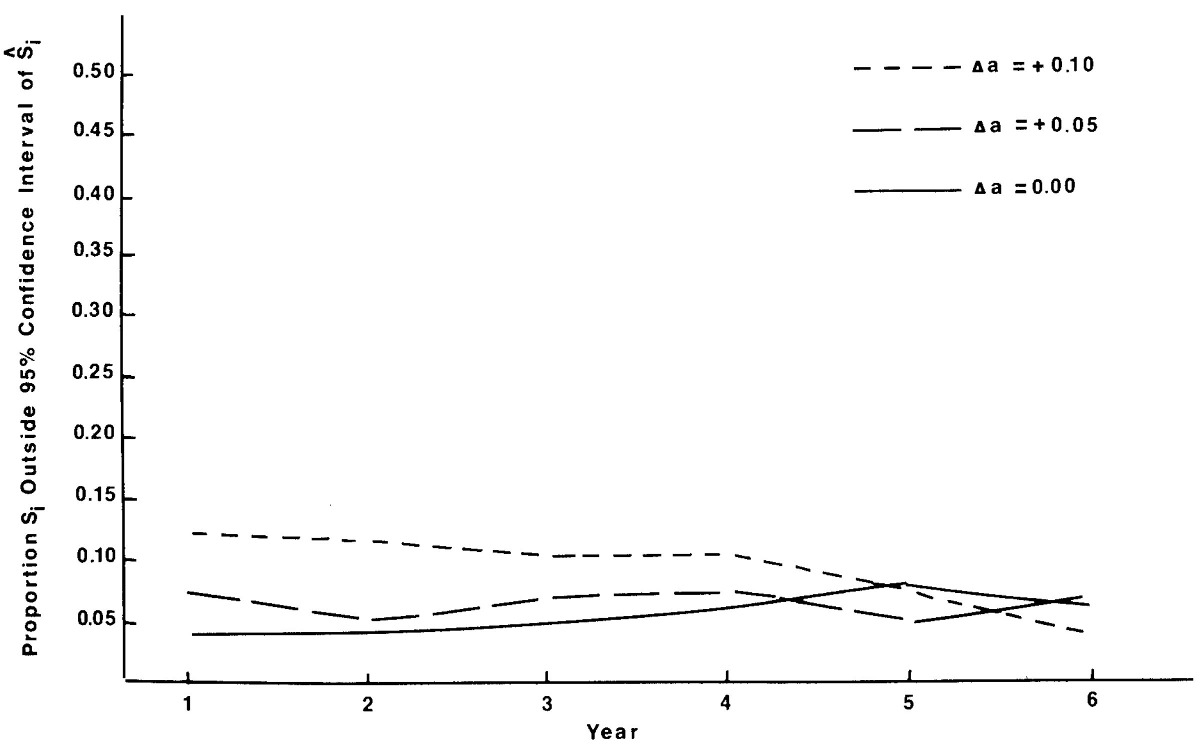

Fig. C-4. Confidence interval coverage of the true survival rate (S_i) for selected Δa.

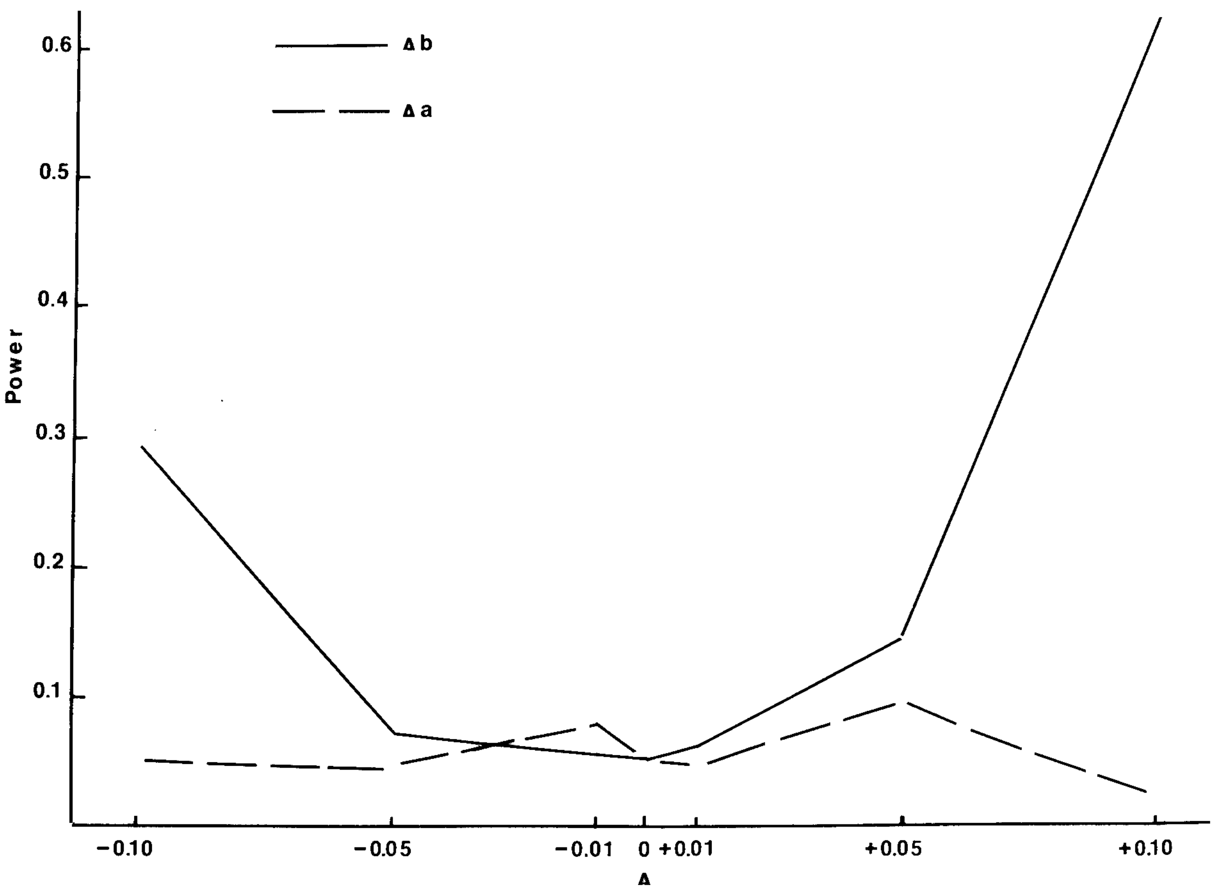

Fig. C-5. Power of the goodness-of-fit test as a function of Δa, Δb.

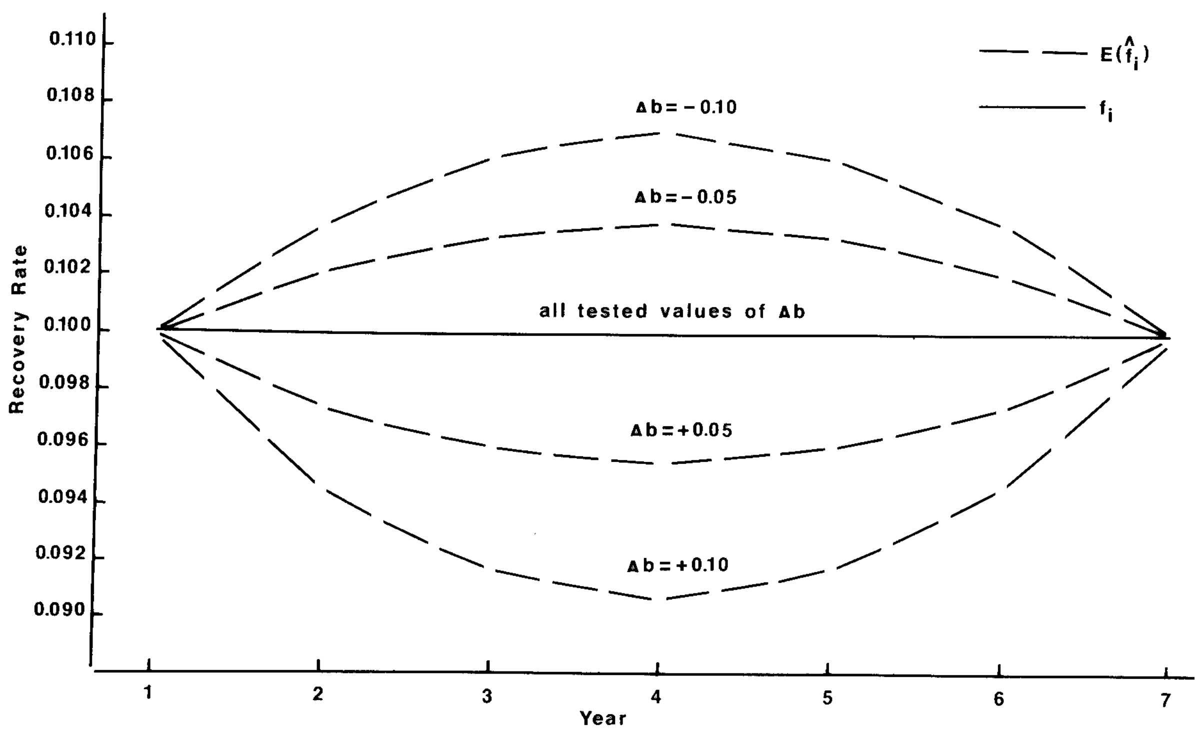

Fig. C-6. $E(\hat{f}_i)$ and true f_i for selected Δb.

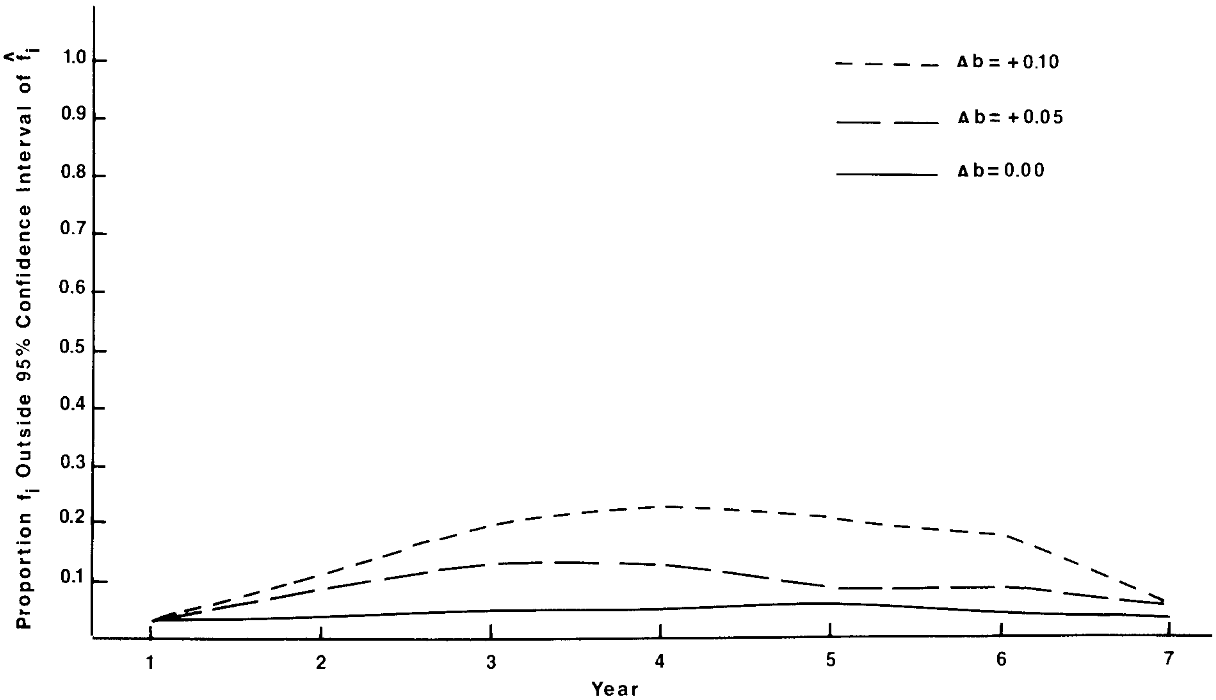

Fig. C-7. Confidence interval coverage of the true recovery rate (f_i) for selected Δb.

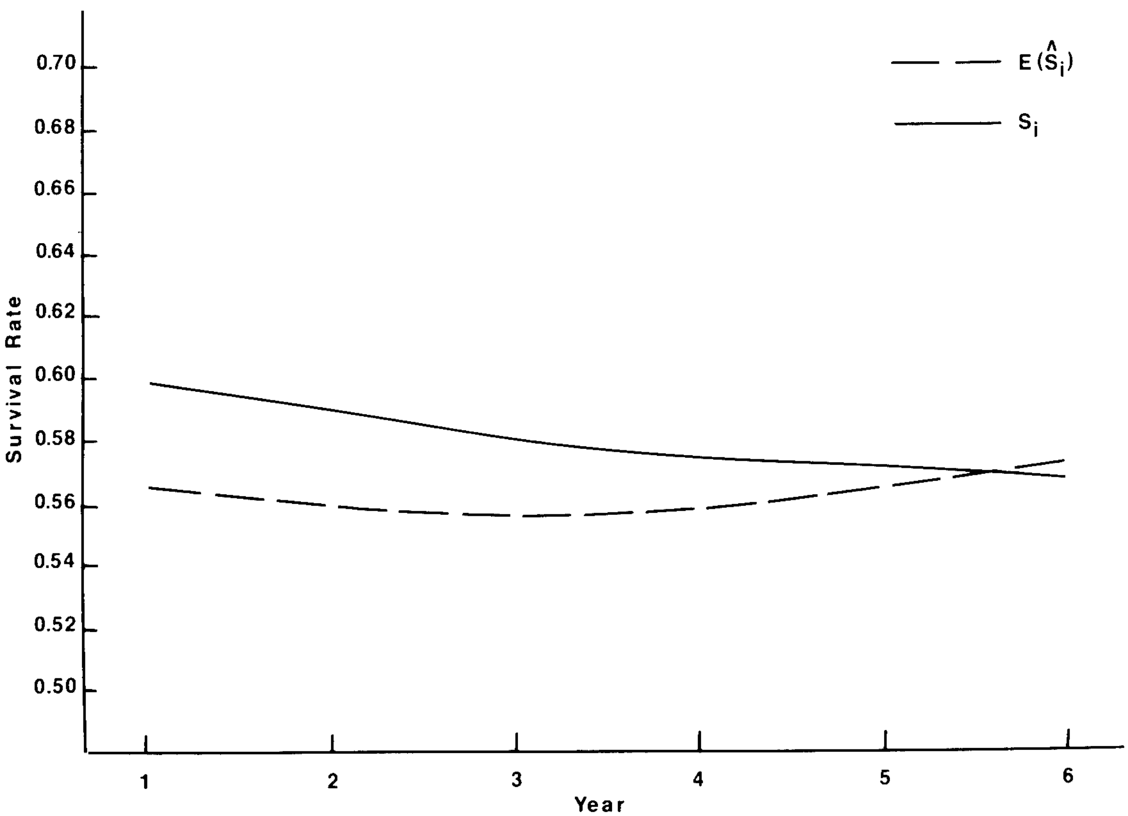

Fig. C-8. $E(\hat{S}_i)$ and true S_i for Δb = -0.05.

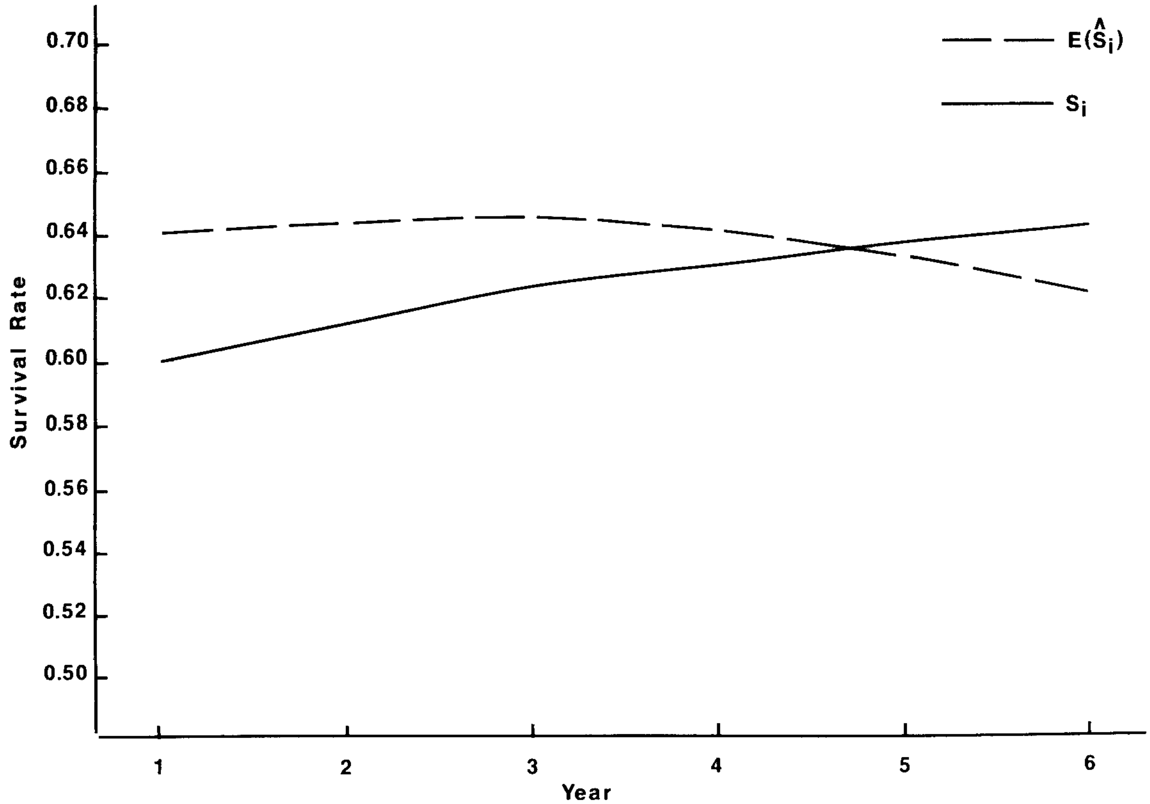

Fig. C-9. $E(\hat{S}_i)$ and true S_i for $\Delta b = +0.05$ (6 years).

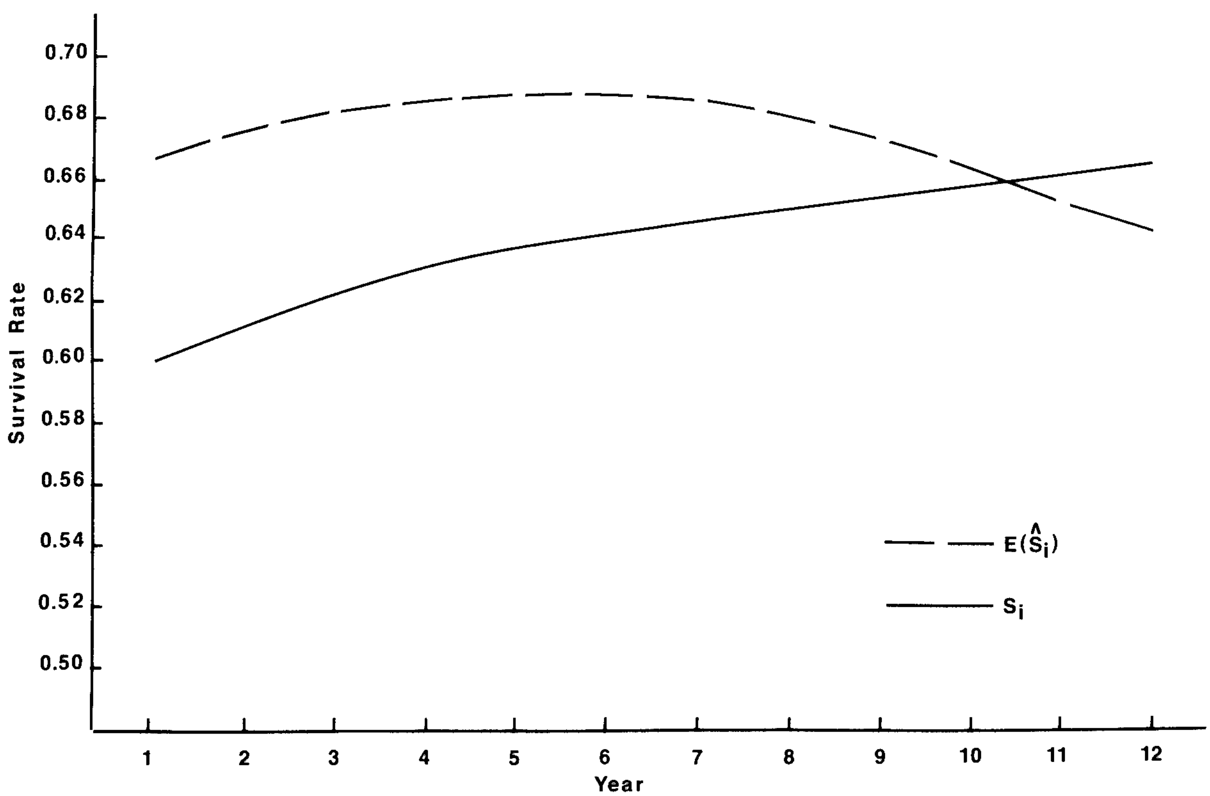

Fig. C-10. $E(\hat{S}_i)$ and true S_i for $\Delta b = +0.05$ (12 years).

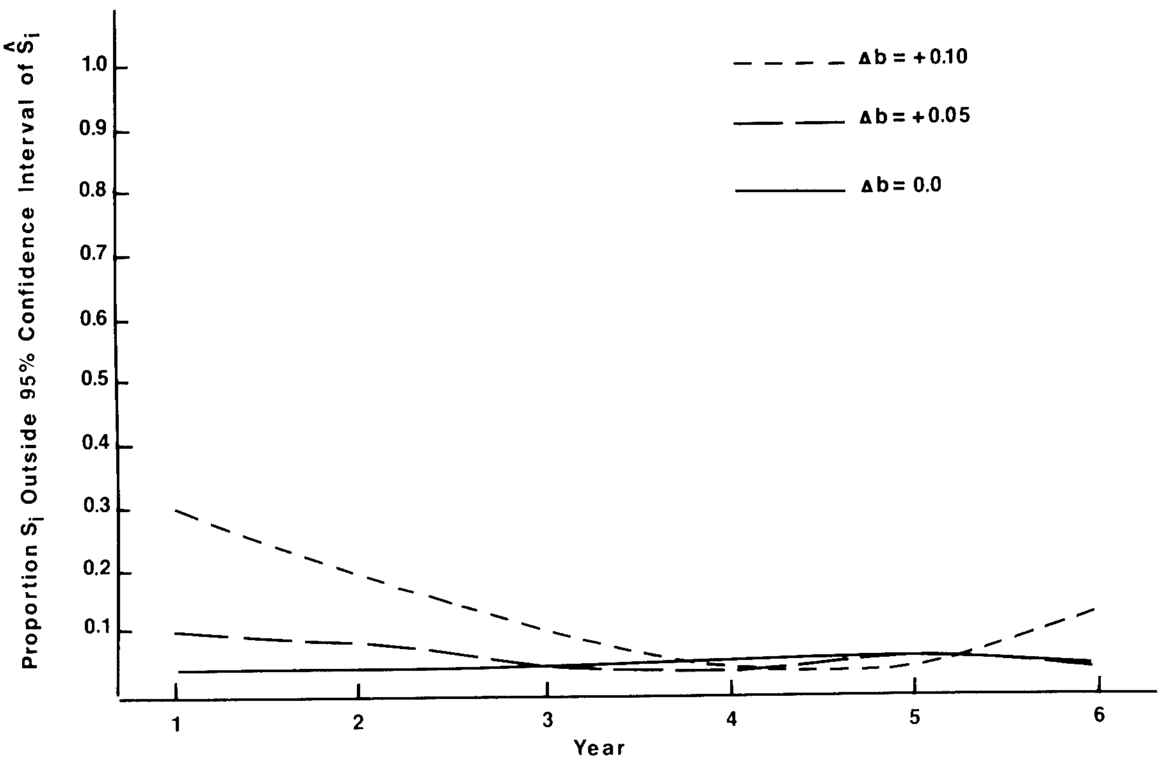

Fig. C-11. Confidence interval coverage of the true survival rate (S_i) for selected Δb.

Appendix D

Derivation of the Total Mallard Harvest from Major Reference Areas

Harvest derivation for each of 35 selected areas is presented in this Appendix with two adjoining figures—one odd-numbered and one even-numbered. Only the areas that accounted for 0.5% or more of the "total" mallard harvest (see Table 23) are illustrated. Harvest estimates (in percent) for all figures (D-1 to D-70) were based on direct and indirect recoveries of all age and sex classes (except locals) that were each adjusted for band reporting rate and population weighted.

Percent derivation of the "total" mallard harvest in a given area from major breeding areas is shown in odd-numbered figures, and mallard harvest derivation similarity indices are shown in even-numbered figures. Computation of these similarity indices is described in detail under Methods. The indices were based on data in Table 23. Values range from 0 to 100; a high similarity index indicates that two areas derive substantial portions of their harvest from the same source areas. In each figure the sources of harvest for the area are compared with sources of harvest for all other areas. Similarity indices equaling or exceeding 50 (midpoint of the range of possible values) are shaded.

Figures are ordered in a general north-to-south sequence within flyways, which are in turn ordered from west to east. The Canadian Provinces, however, are illustrated first.

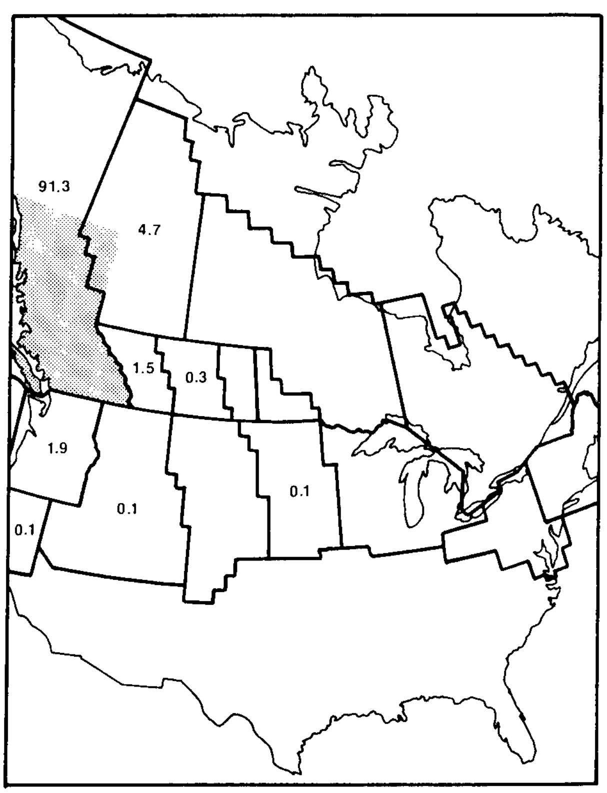

Fig. D-1. Percent derivation of the mallard harvest in *British Columbia* (shaded) from major breeding reference areas.

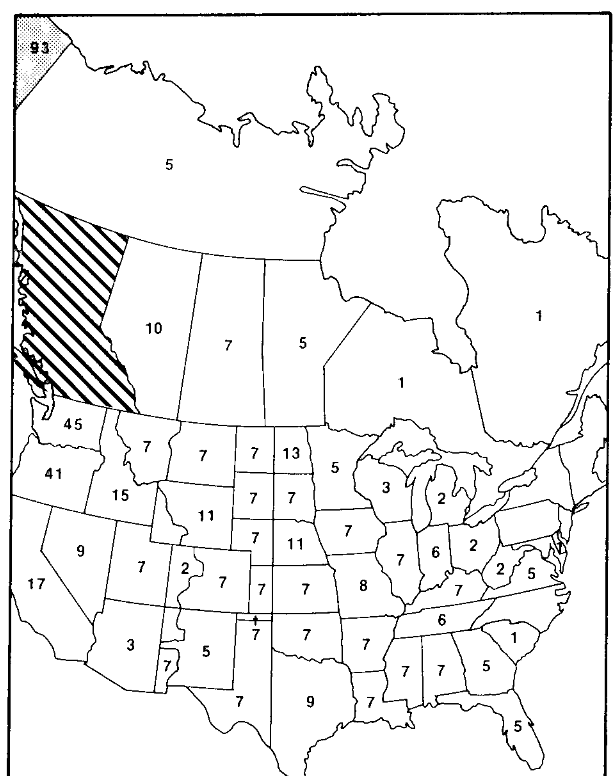

Fig. D-2. Mallard harvest derivation similarity indices for *British Columbia* (hatched) compared with indices for other harvest areas.

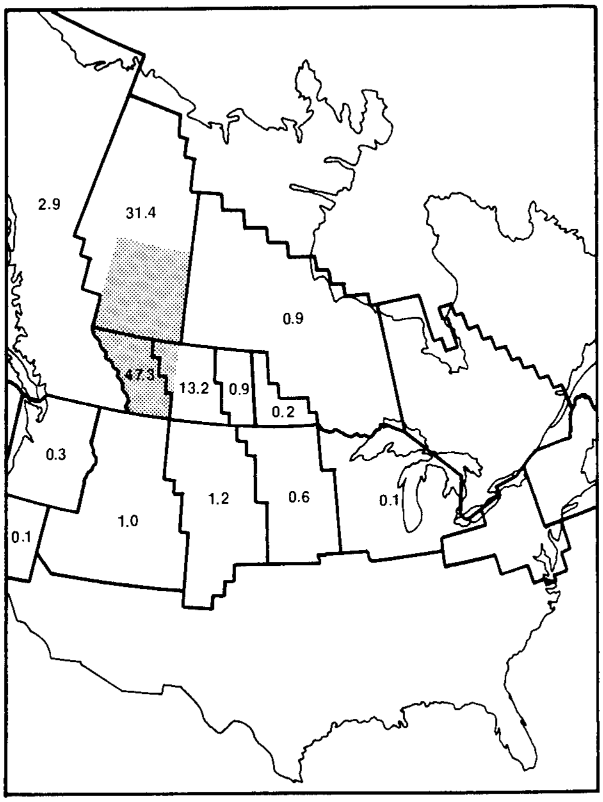

Fig. D-3. Percent derivation of the mallard harvest in *Alberta* (shaded) from major breeding reference areas.

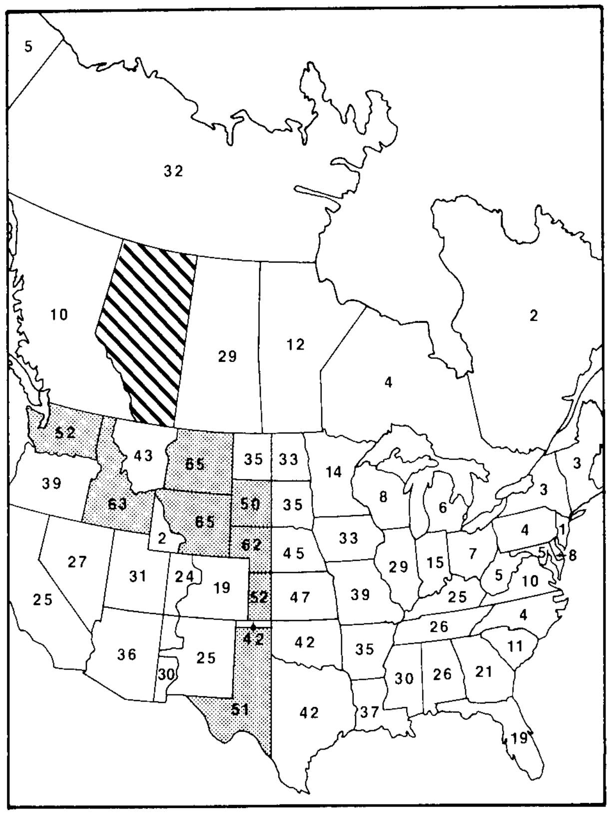

Fig. D-4. Mallard harvest derivation similarity indices for *Alberta* (hatched) compared with indices for other harvest areas.

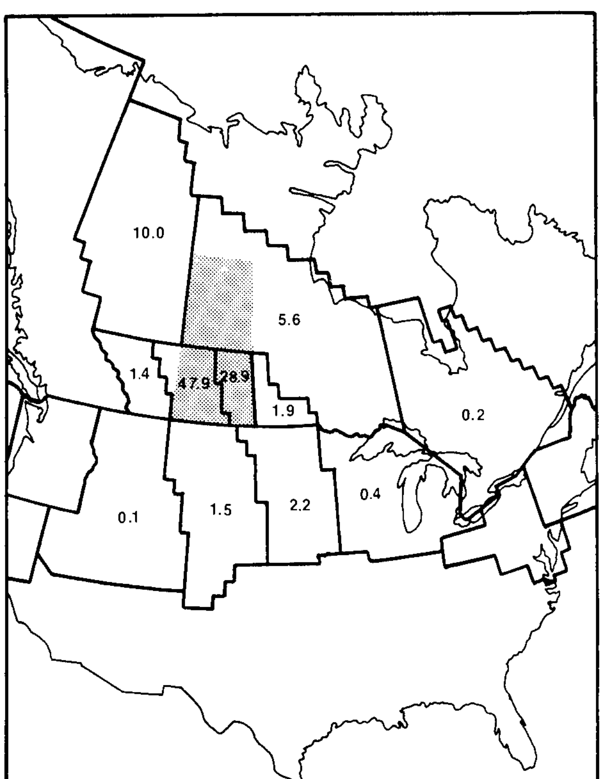

Fig. D-5. Percent derivation of the mallard harvest in *Saskatchewan* (shaded) from major breeding reference areas.

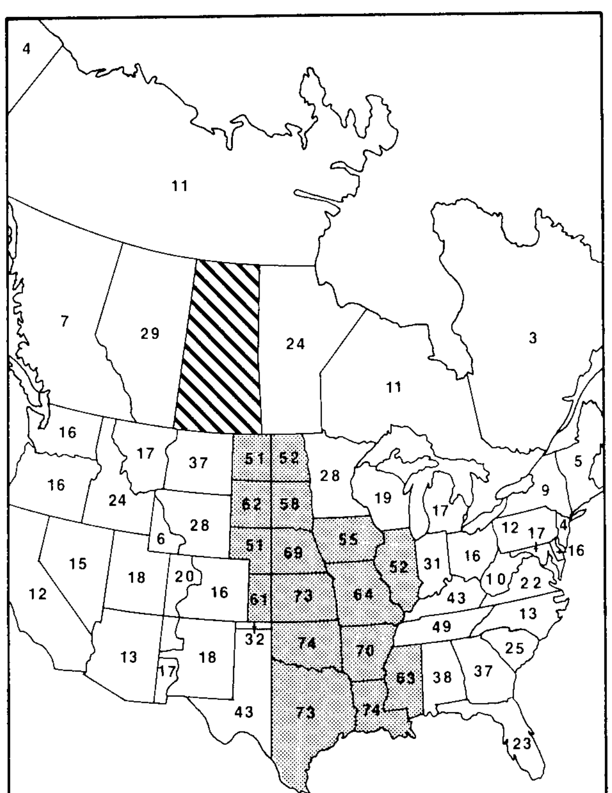

Fig. D-6. Mallard harvest derivation similarity indices for *Saskatchewan* (hatched) compared with indices for other harvest areas.

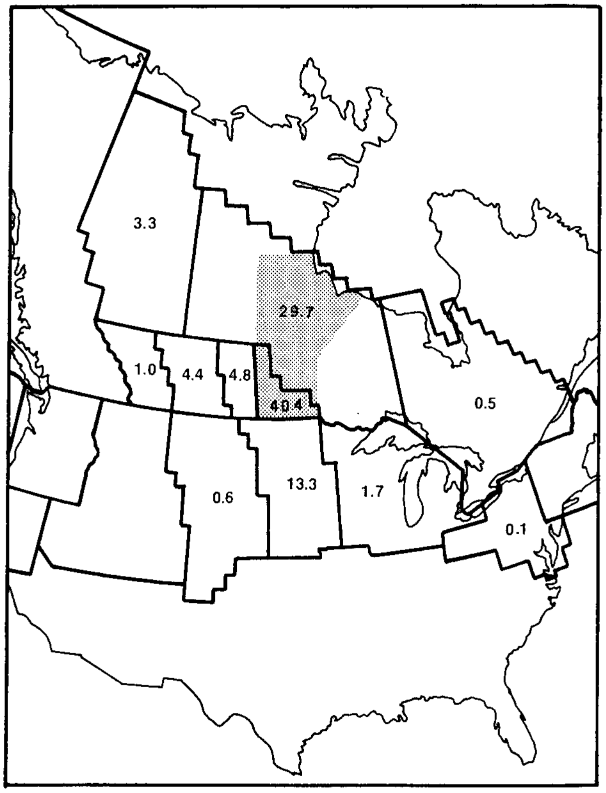

Fig. D-7. Percent derivation of the mallard harvest in *Manitoba* (shaded) from major breeding reference areas.

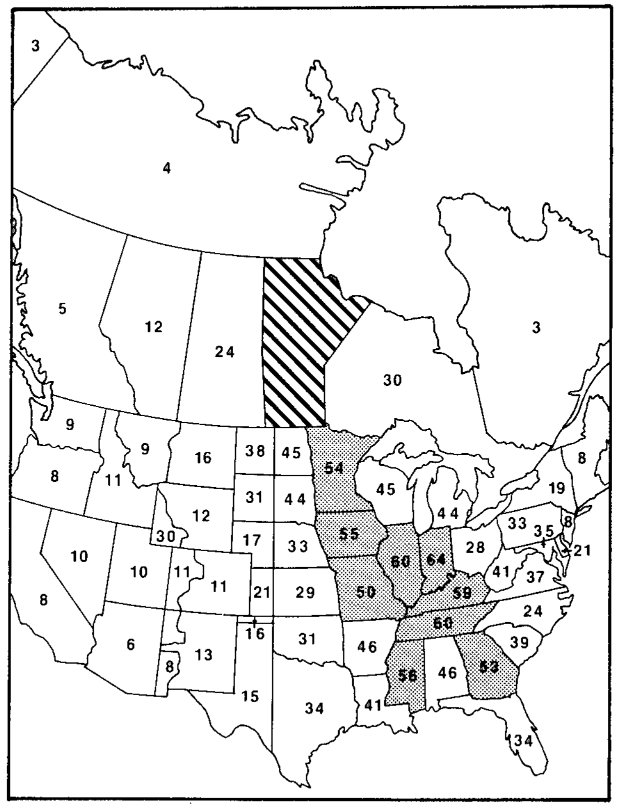

Fig. D-8. Mallard harvest derivation similarity indices for *Manitoba* (hatched) compared with indices for other harvest areas.

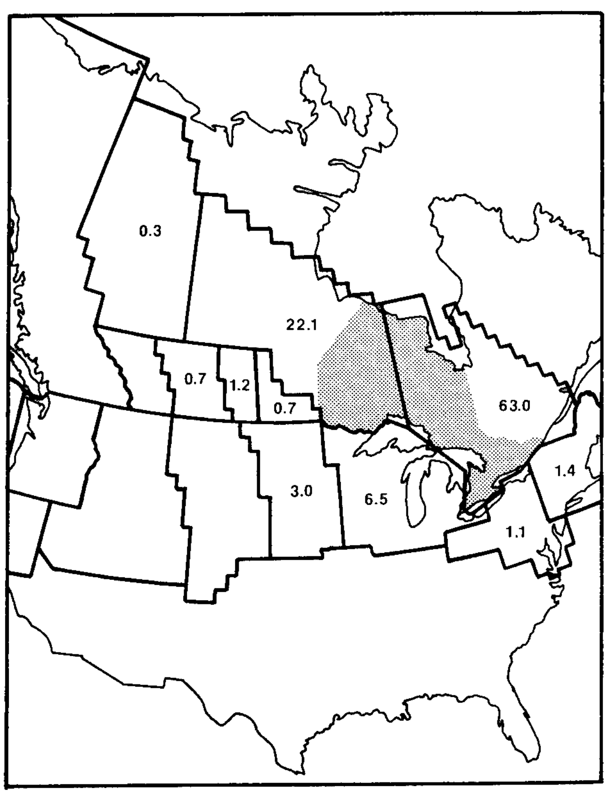

Fig. D-9. Percent derivation of the mallard harvest in *Ontario* (shaded) from major breeding reference areas.

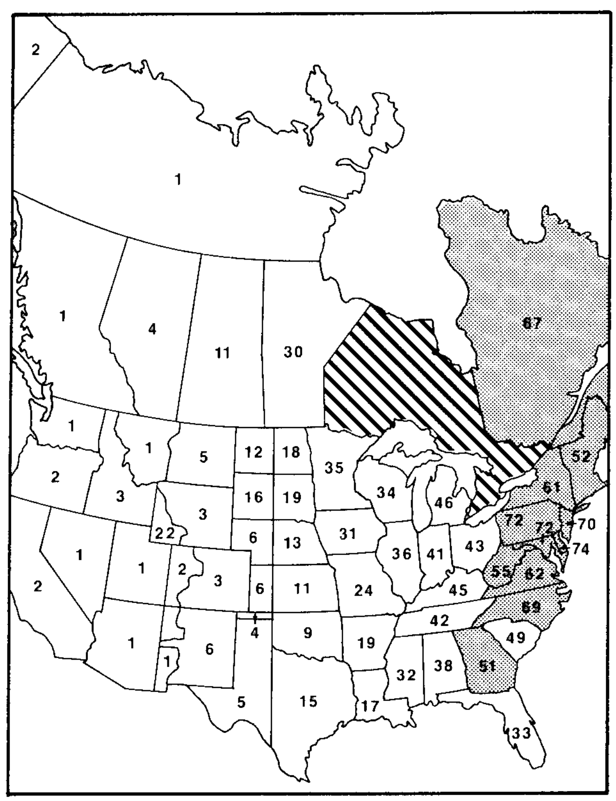

Fig. D-10. Mallard harvest derivation similarity indices for *Ontario* (hatched) compared with indices for other harvest areas.

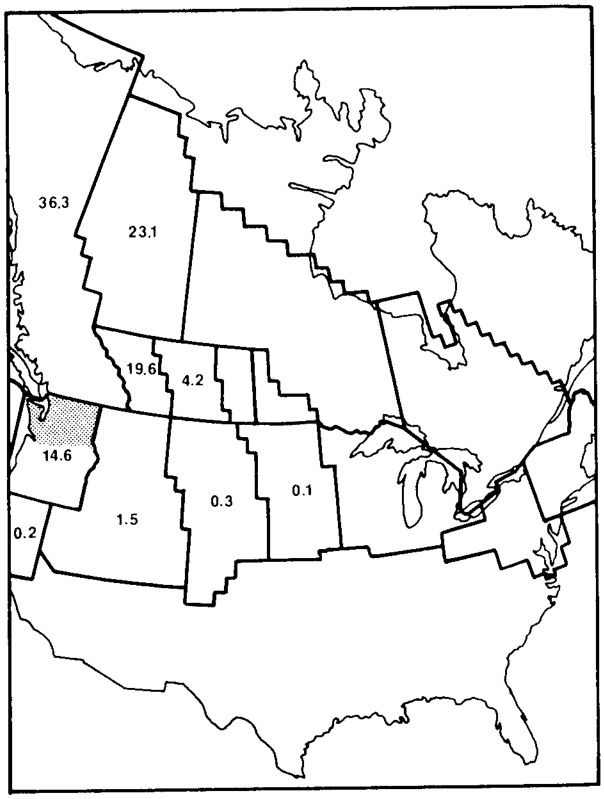

Fig. D-11. Percent derivation of the mallard harvest in *Washington* (shaded) from major breeding reference areas.

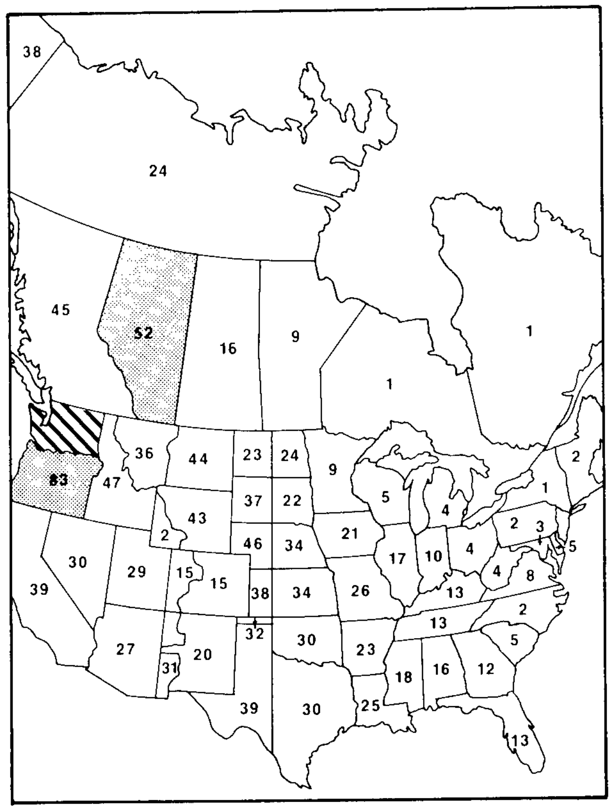

Fig. D-12. Mallard harvest derivation similarity indices for *Washington* (hatched) compared with indices for other harvest areas.

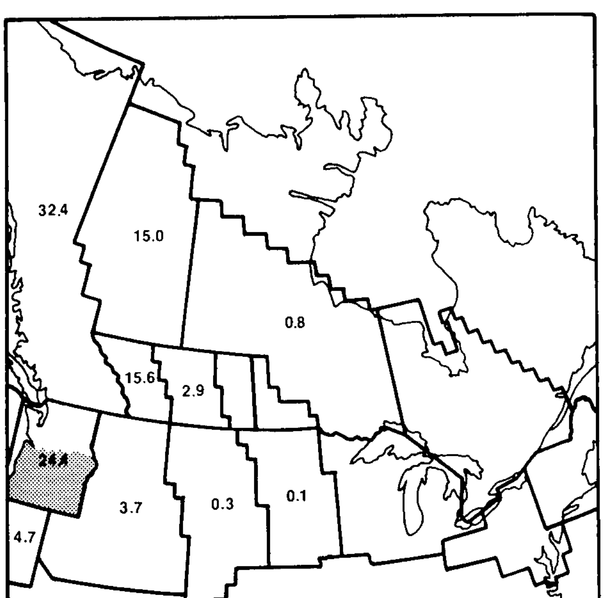

Fig. D-13. Percent derivation of the mallard harvest in *Oregon* (shaded) from major breeding reference areas.

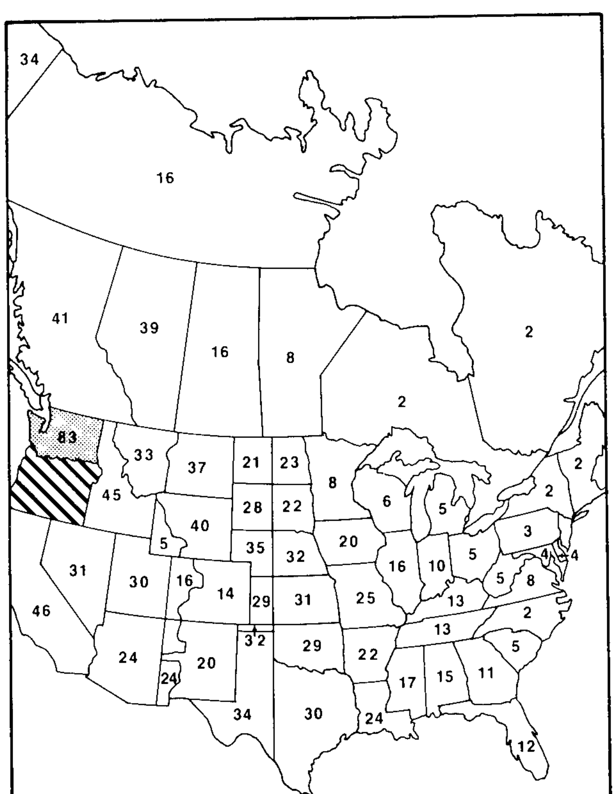

Fig. D-14. Mallard harvest derivation similarity indices for *Oregon* (hatched) compared with indices for other harvest areas.

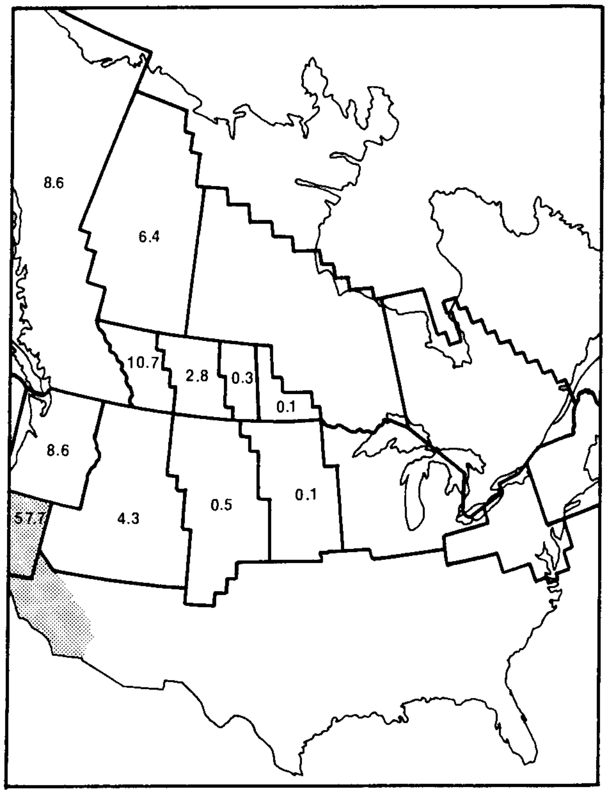

Fig. D-15. Percent derivation of the mallard harvest in *California* (shaded) from major breeding reference areas.

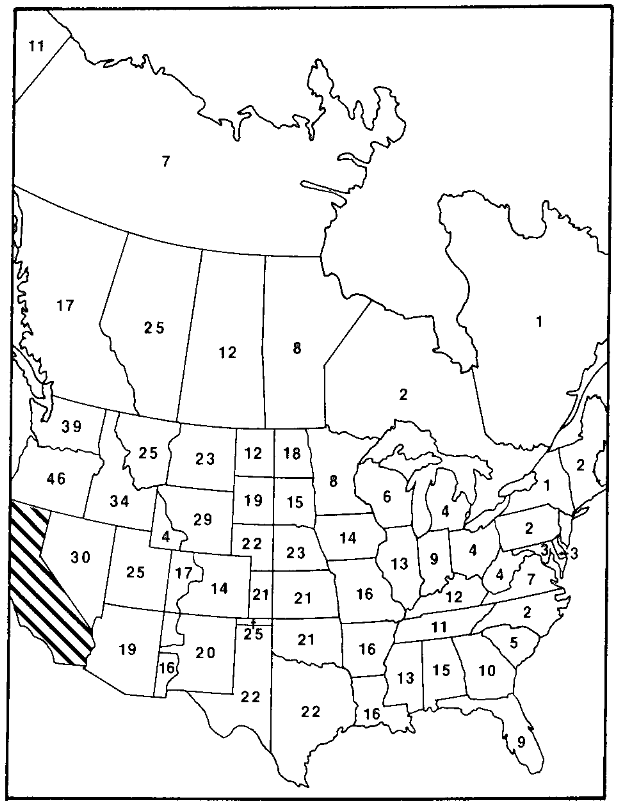

Fig. D-16. Mallard harvest derivation similarity indices for *California* (hatched) compared with indices for other harvest areas.

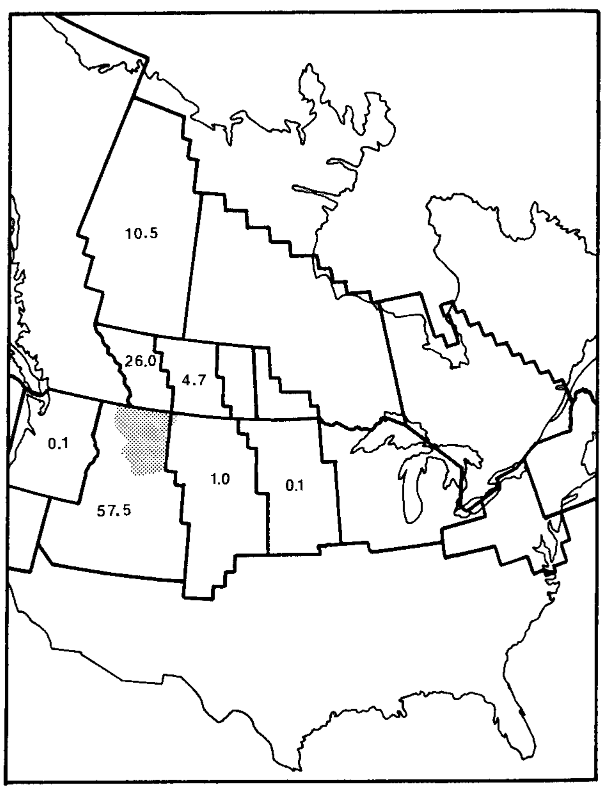

Fig. D-17. Percent derivation of the mallard harvest in *Western Montana* (shaded) from major breeding reference areas.

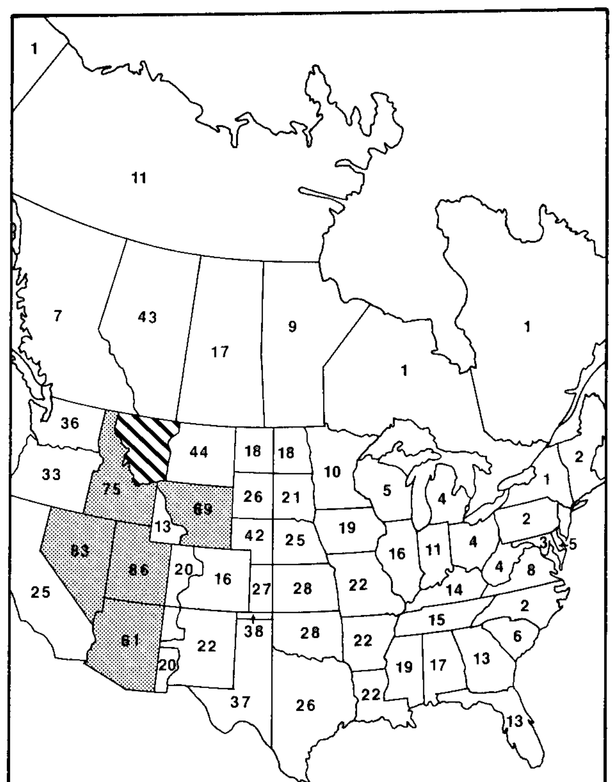

Fig. D-18. Mallard harvest derivation similarity indices for *Western Montana* (hatched) compared with indices for other harvest areas.

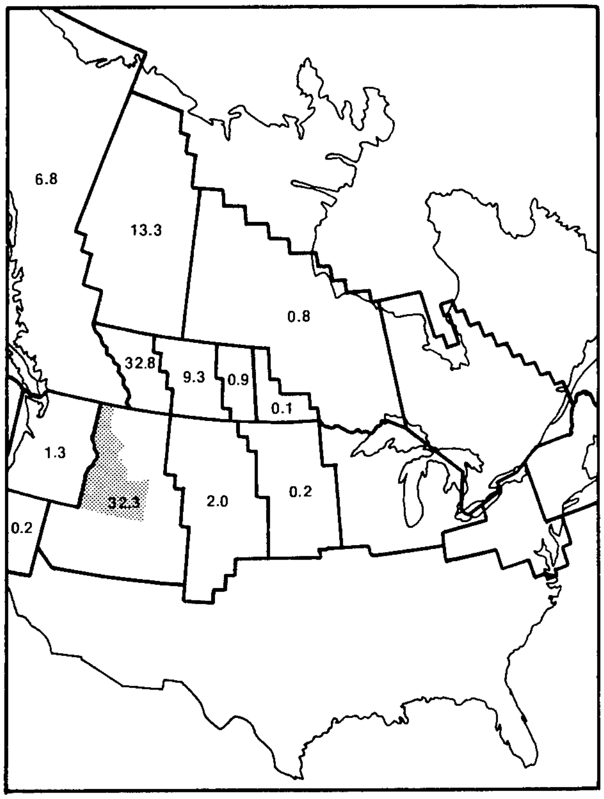

Fig. D-19. Percent derivation of the mallard harvest in *Idaho* (shaded) from major breeding reference areas.

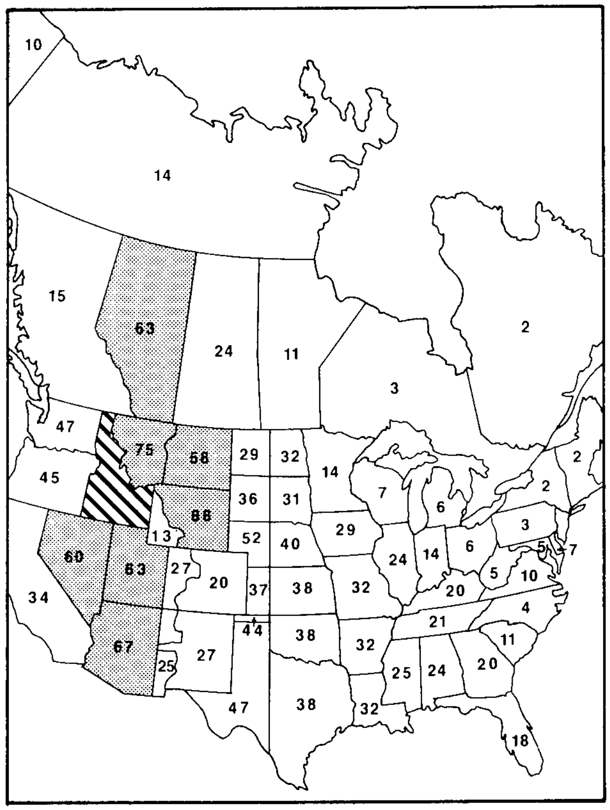

Fig. D-20. Mallard harvest derivation similarity indices for *Idaho* (hatched) compared with indices for other harvest areas.

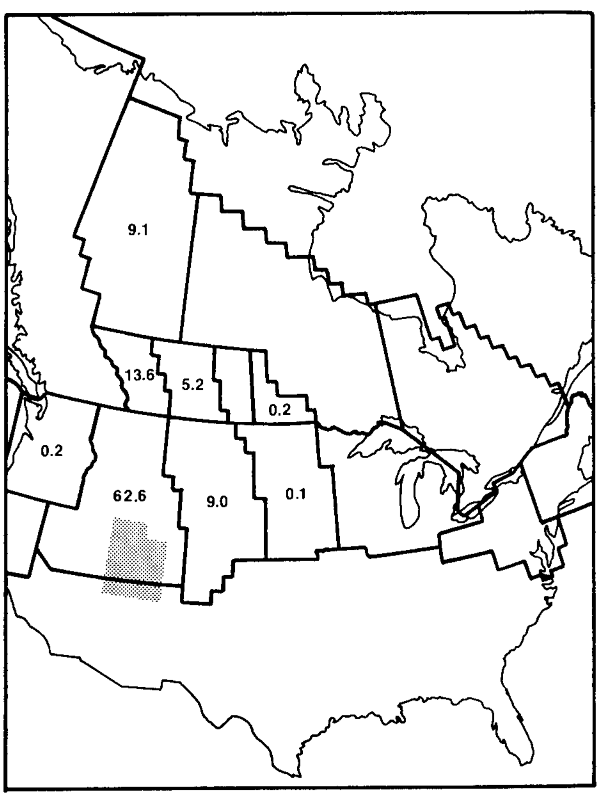

Fig. D-21. Percent derivation of the mallard harvest in *Utah* (shaded) from major breeding reference areas.

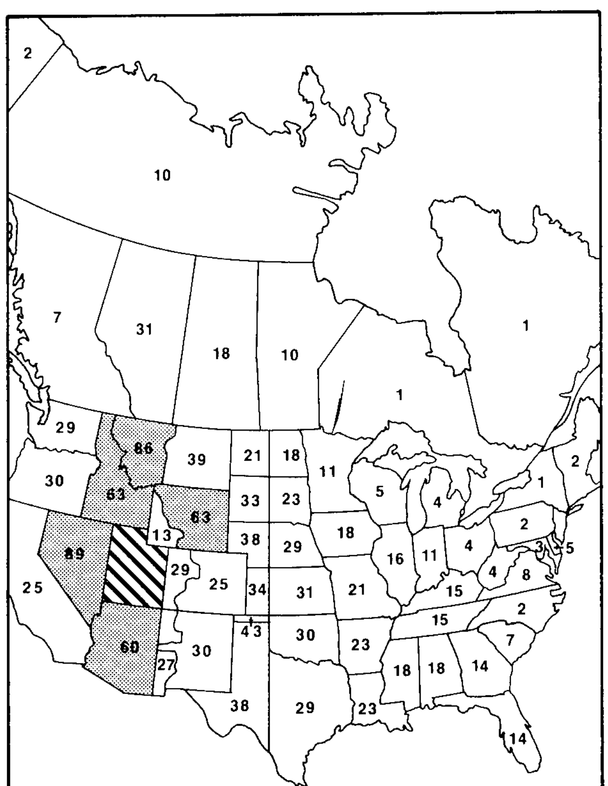

Fig. D-22. Mallard harvest derivation similarity indices for *Utah* (hatched) compared with indices for other harvest areas.

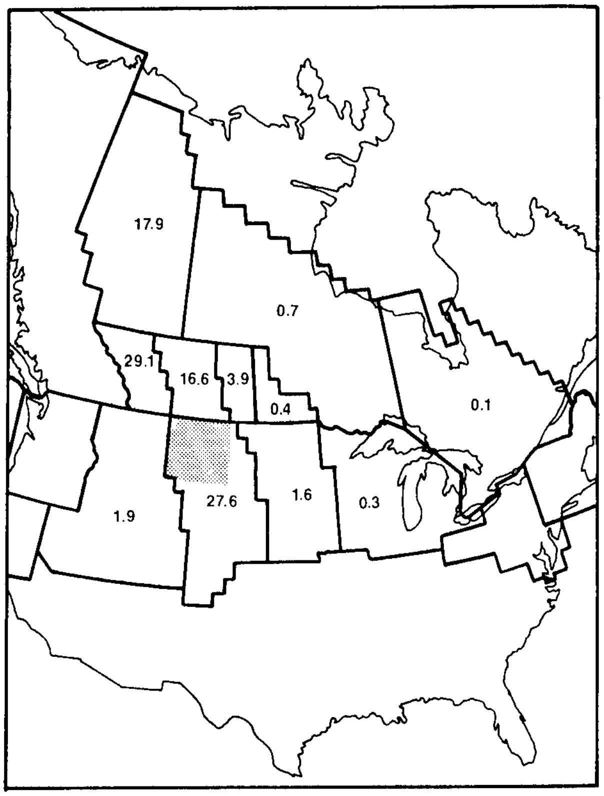

Fig. D-23. Percent derivation of the mallard harvest in *Eastern Montana* (shaded) from major breeding reference areas.

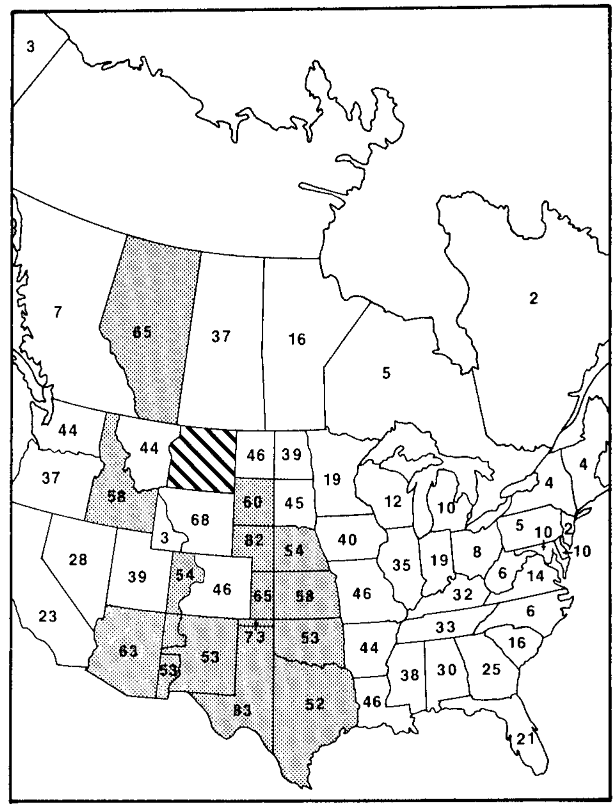

Fig. D-24. Mallard harvest derivation similarity indices for *Eastern Montana* (hatched) compared with indices for other harvest areas.

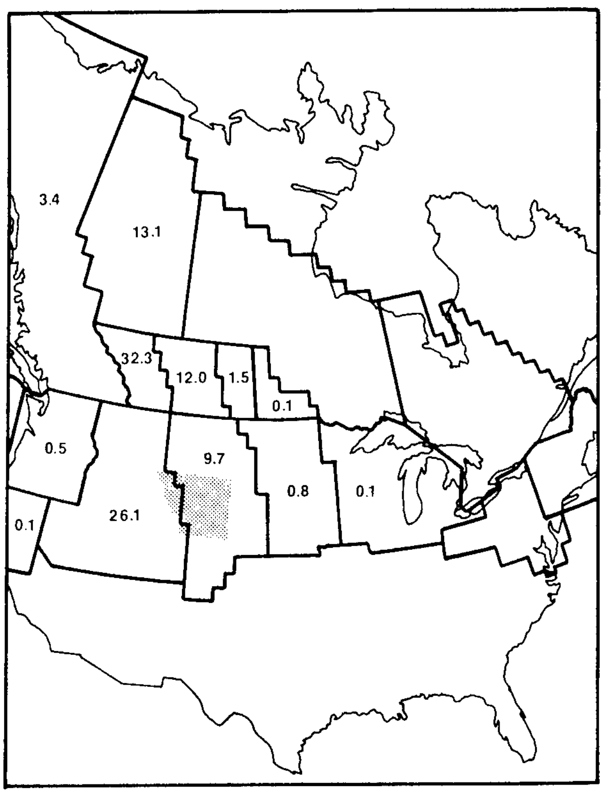

Fig. D-25. Percent derivation of the mallard harvest in *Eastern Wyoming* (shaded) from major breeding reference areas.

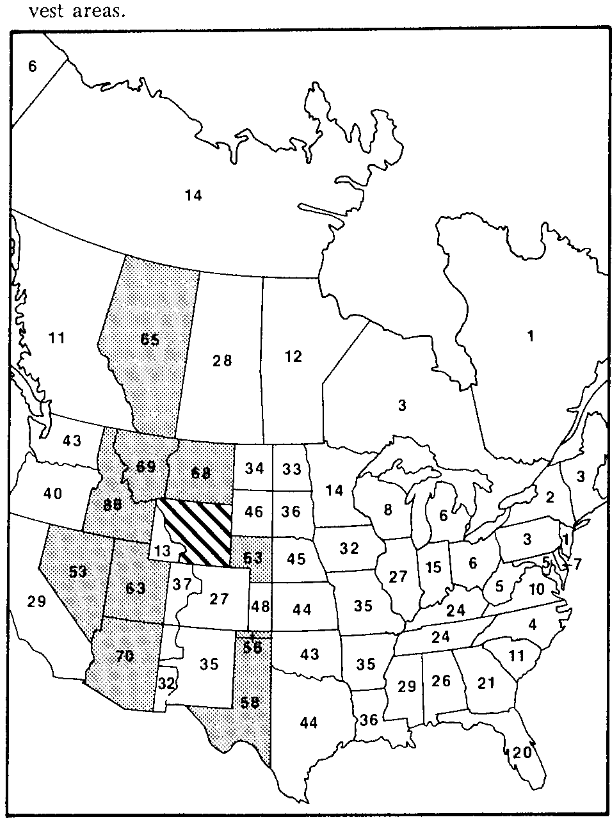

Fig. D-26. Mallard harvest derivation similarity indices for *Eastern Wyoming* (hatched) compared with indices for other harvest areas.

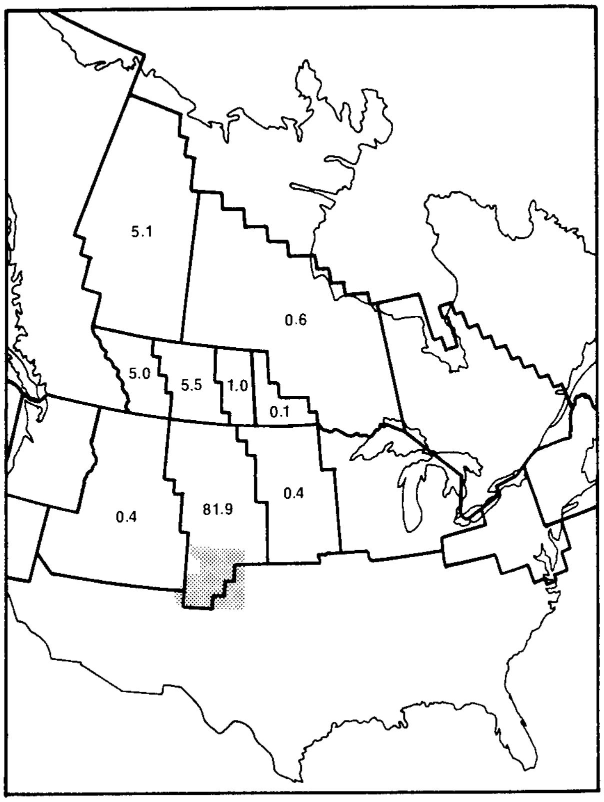

Fig. D-27. Percent derivation of the mallard harvest in *Eastern Colorado* (shaded) from major breeding reference areas.

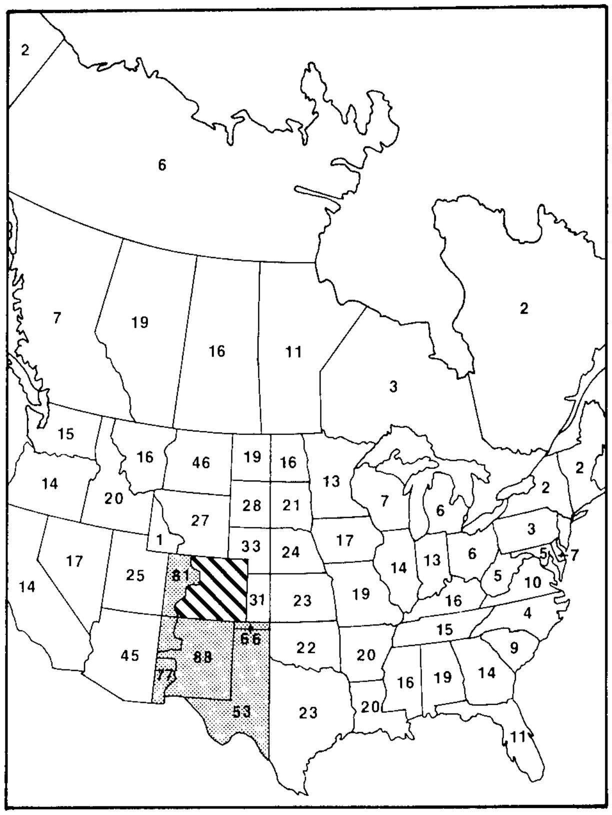

Fig. D-28. Mallard harvest derivation similarity indices for *Eastern Colorado* (hatched) compared with indices for other harvest areas.

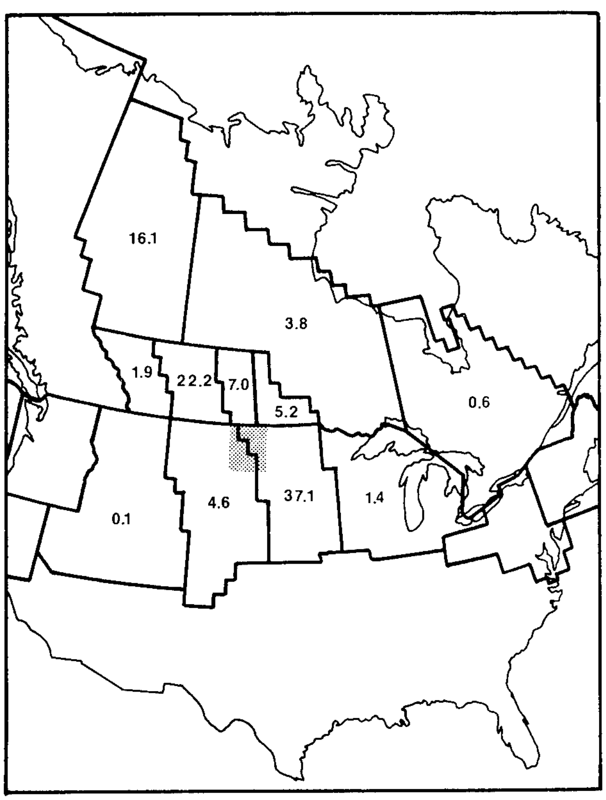

Fig. D-29. Percent derivation of the mallard harvest in *Western North Dakota* (shaded) from major breeding reference areas.

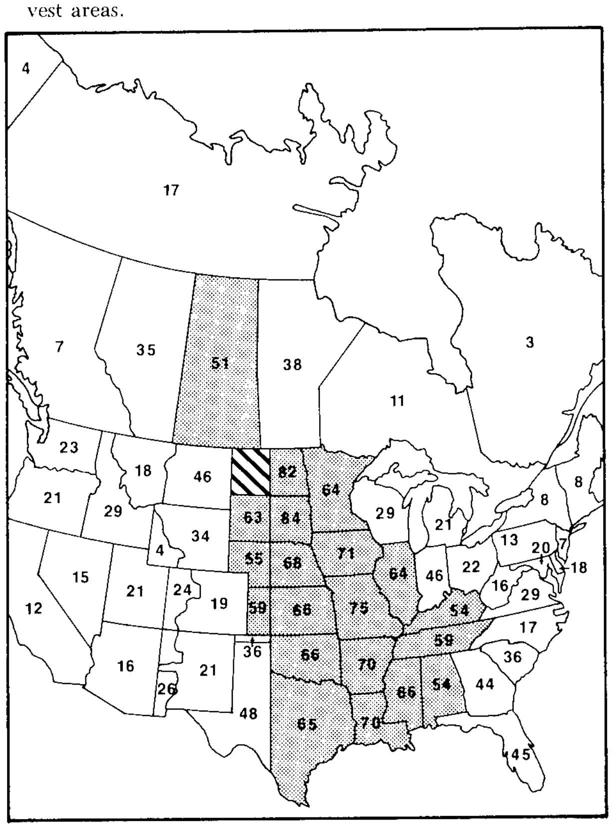

Fig. D-30. Mallard harvest derivation similarity indices for *Western North Dakota* (hatched) compared with indices for other harvest areas.

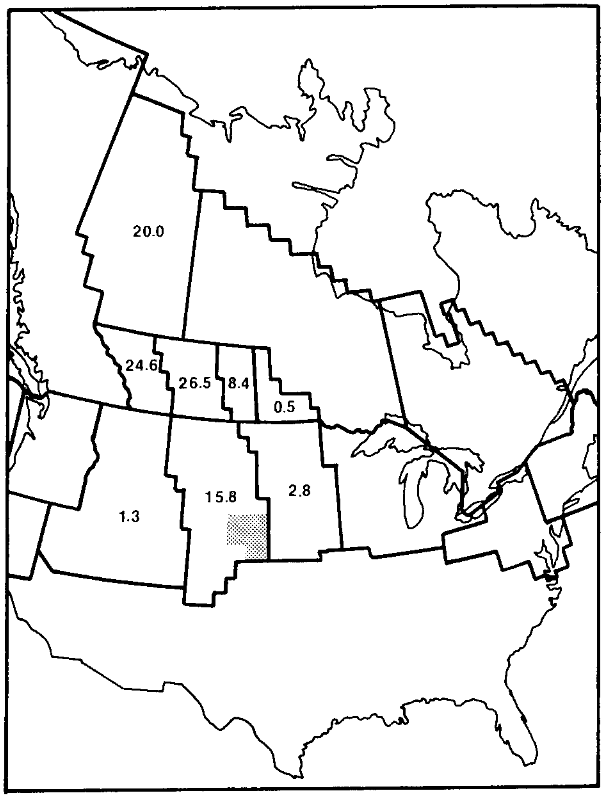

Fig. D-31. Percent derivation of the mallard harvest in *Western Nebraska* (shaded) from major breeding reference areas.

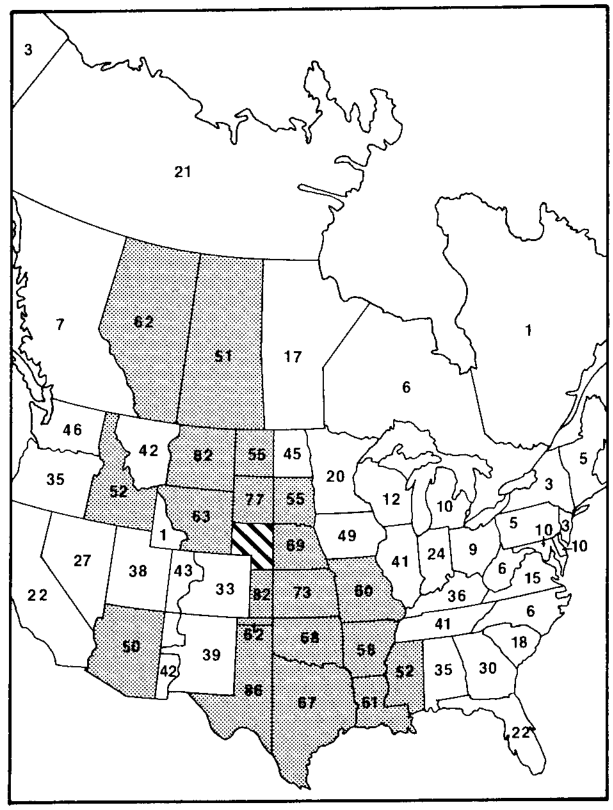

Fig. D-32. Mallard harvest derivation similarity indices for *Western Nebraska* (hatched) compared with indices for other harvest areas.

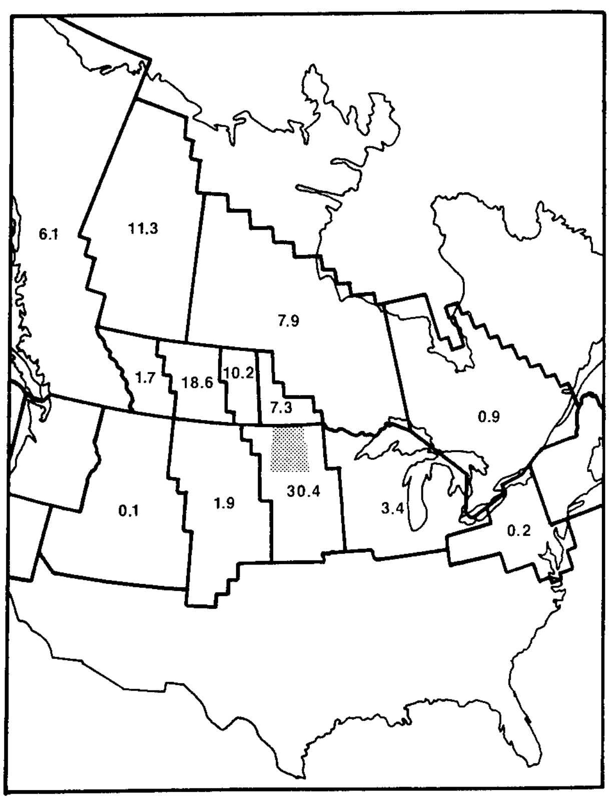

Fig. D-33. Percent derivation of the mallard harvest in *Eastern North Dakota* (shaded) from major breeding reference areas.

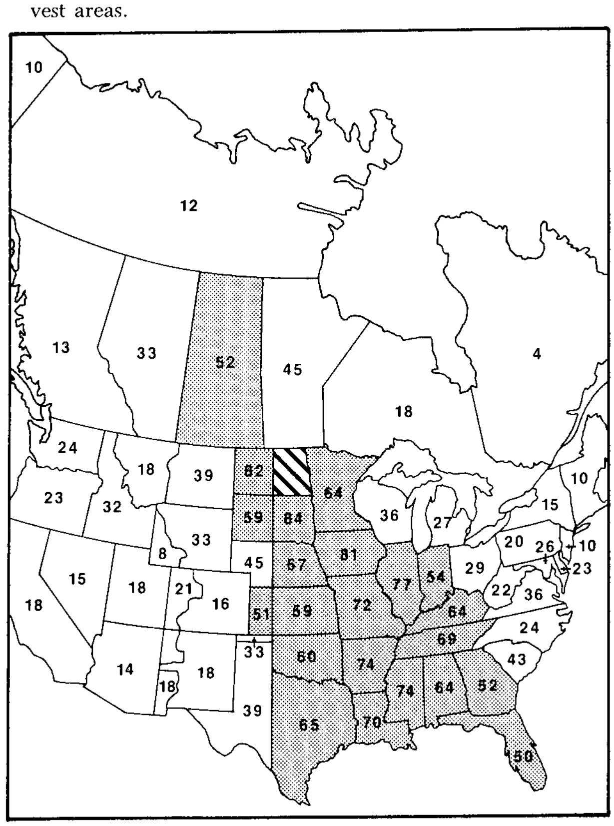

Fig. D-34. Mallard harvest derivation similarity indices for *Eastern North Dakota* (hatched) compared with indices for other harvest areas.

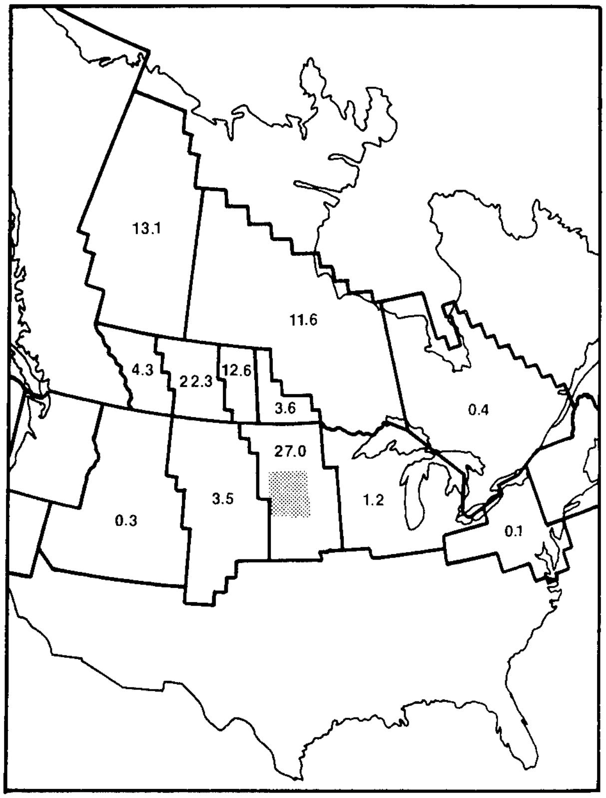

Fig. D-35. Percent derivation of the mallard harvest in *Eastern South Dakota* (shaded) from major breeding reference areas.

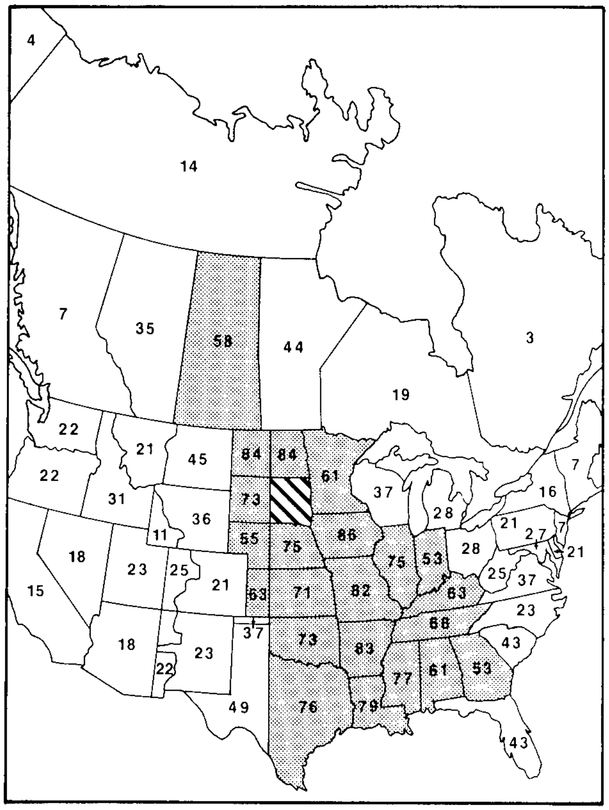

Fig. D-36. Mallard harvest derivation similarity indices for *Eastern South Dakota* (hatched) compared with indices for other harvest areas.

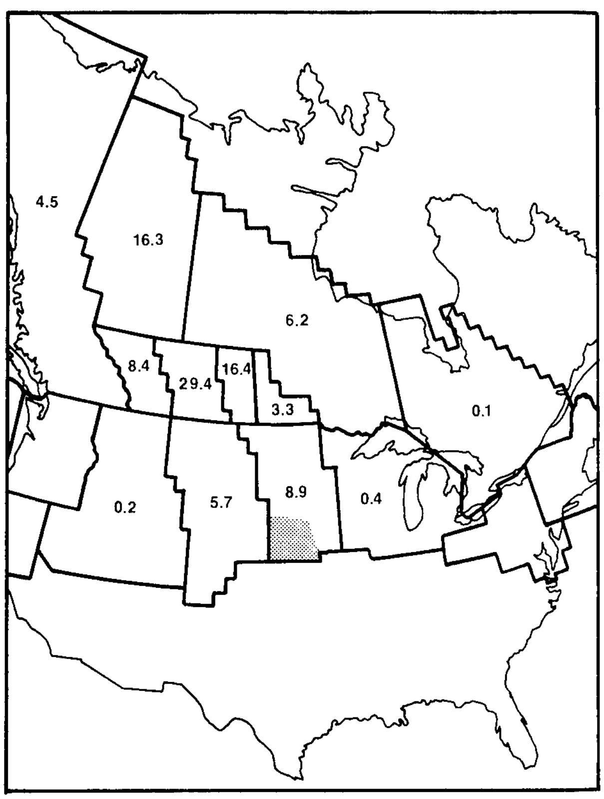

Fig. D-37. Percent derivation of the mallard harvest in *Eastern Nebraska* (shaded) from major breeding reference areas.

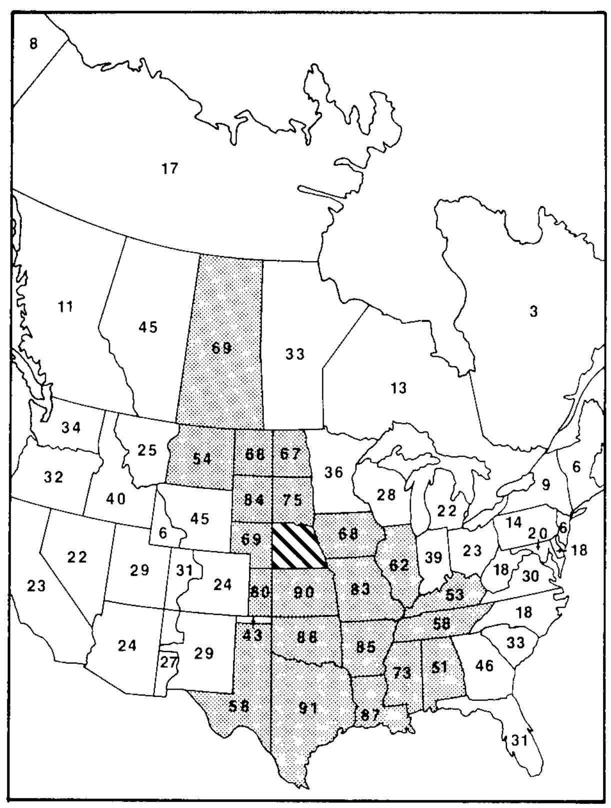

Fig. D-38. Mallard harvest derivation similarity indices for *Eastern Nebraska* (hatched) compared with indices for other harvest areas.

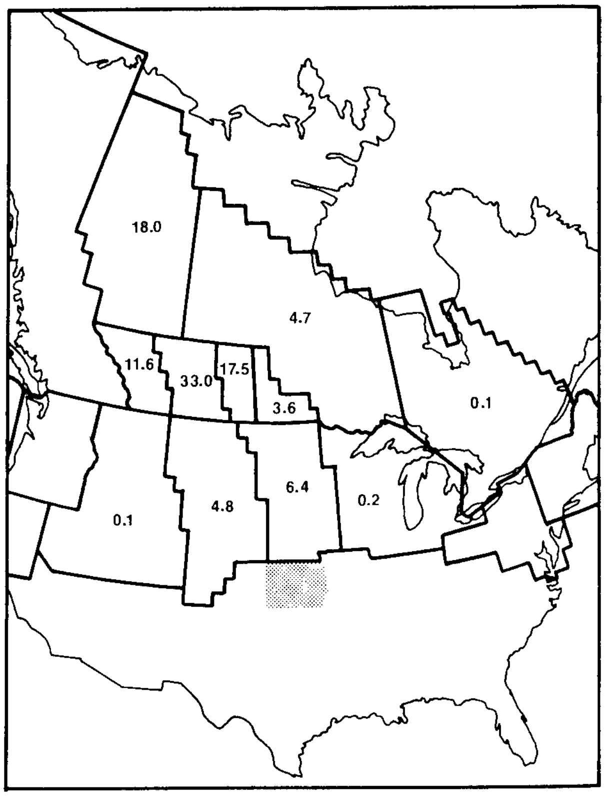

Fig. D-39. Percent derivation of the mallard harvest in *Eastern Kansas* (shaded) from major breeding reference areas.

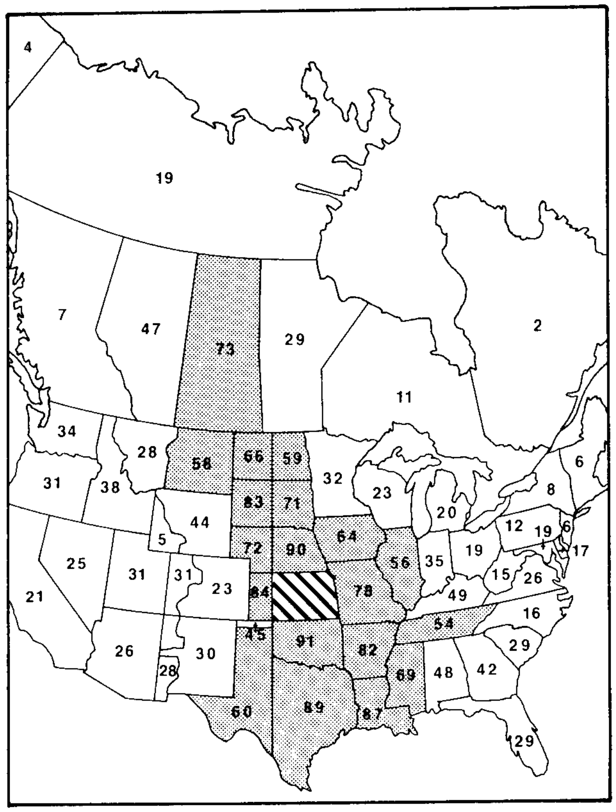

Fig. D-40. Mallard harvest derivation similarity indices for *Eastern Kansas* (hatched) compared with indices for other harvest areas.

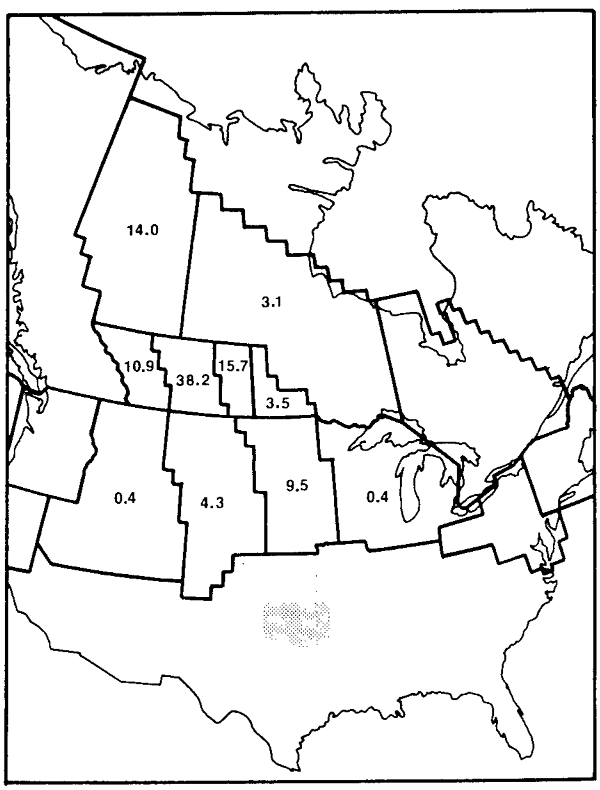

Fig. D-41. Percent derivation of the mallard harvest in *Eastern Oklahoma* (shaded) from major breeding reference areas.

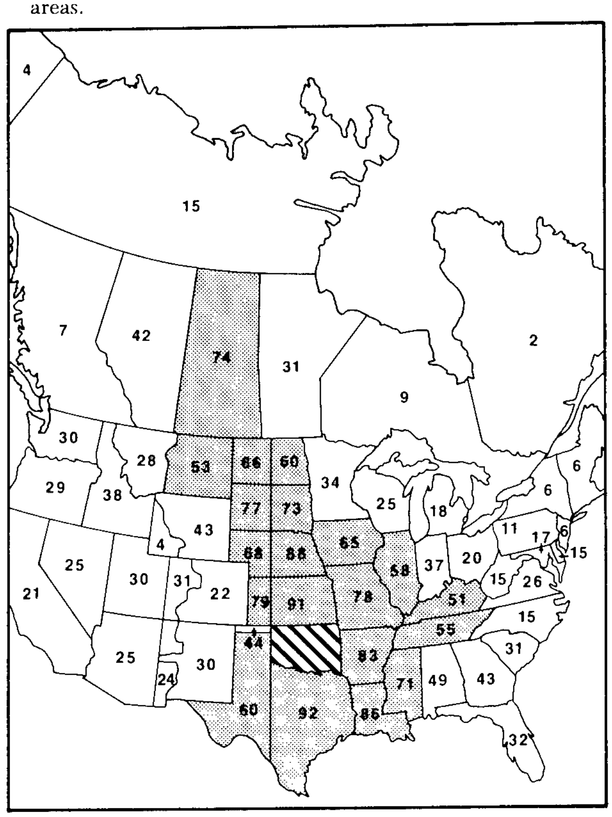

Fig. D-42. Mallard harvest derivation similarity indices for *Eastern Oklahoma* (hatched) compared with indices for other harvest areas.

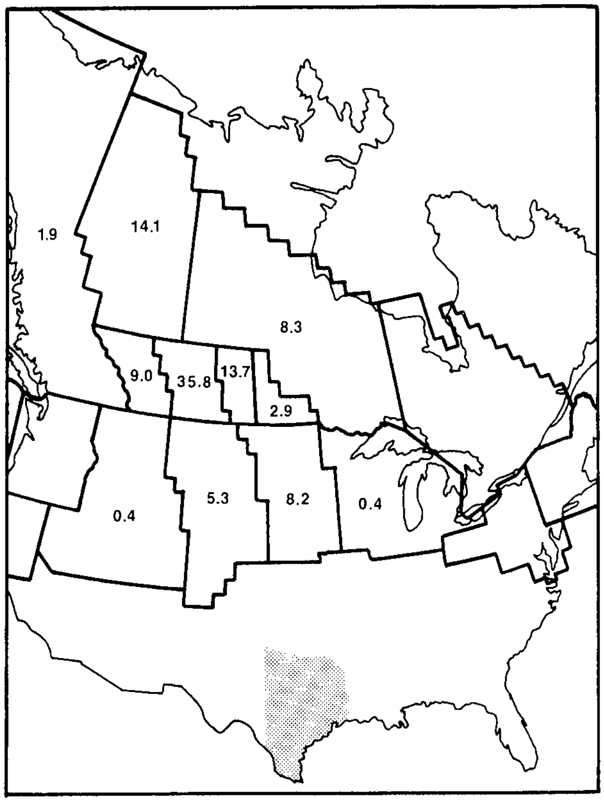

Fig. D-43. Percent derivation of the mallard harvest in *Eastern Texas* (shaded) from major breeding reference areas.

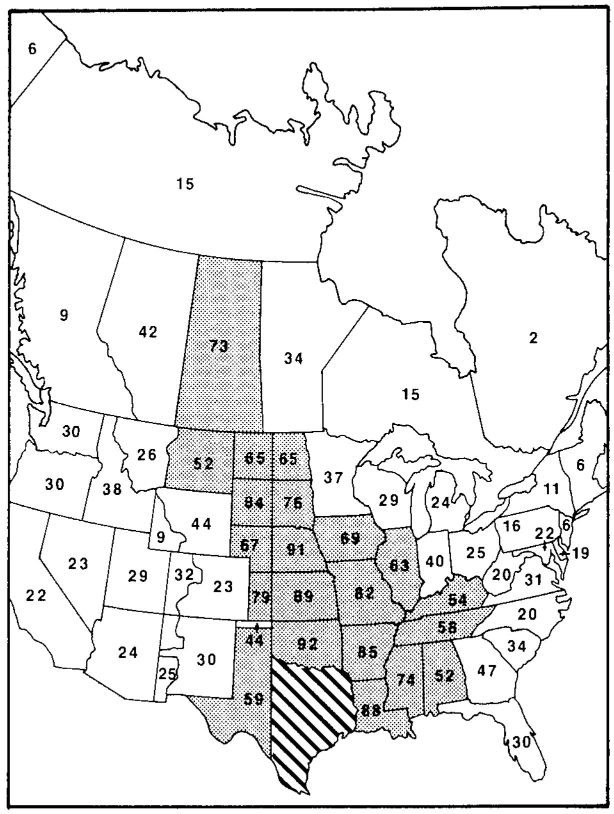

Fig. D-44. Mallard harvest derivation similarity indices for *Eastern Texas* (hatched) compared with indices for other harvest areas.

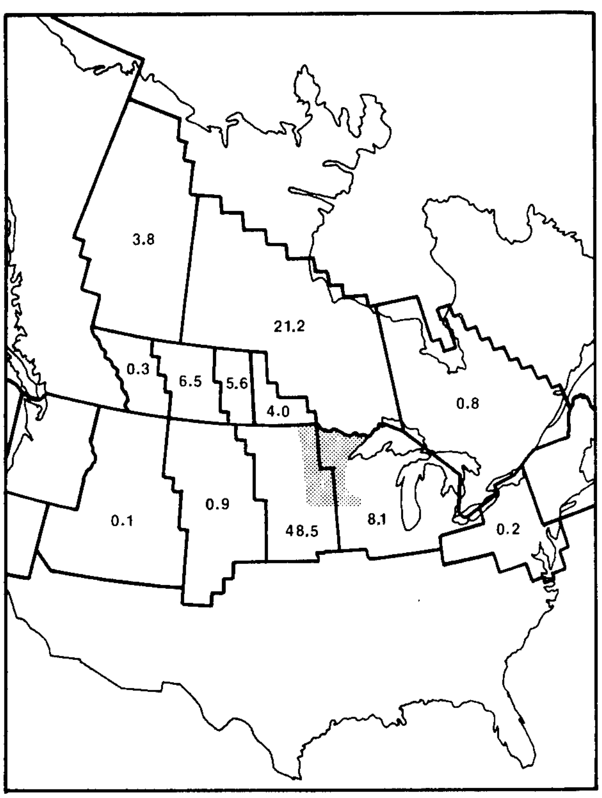

Fig. D-45. Percent derivation of the mallard harvest in *Minnesota* (shaded) from major breeding reference areas.

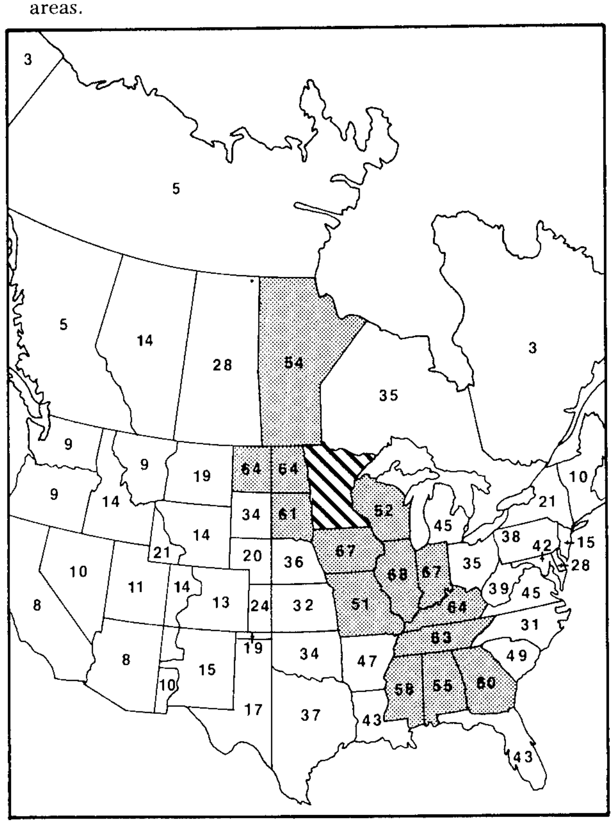

Fig. D-46. Mallard harvest derivation similarity indices for *Minnesota* (hatched) compared with indices for other harvest areas.

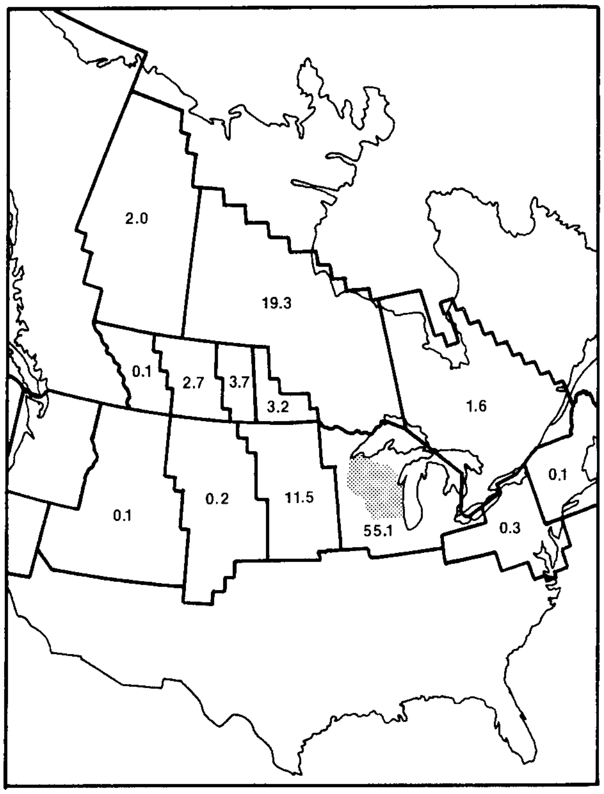

Fig. D-47. Percent derivation of the mallard harvest in *Wisconsin* (shaded) from major breeding reference areas.

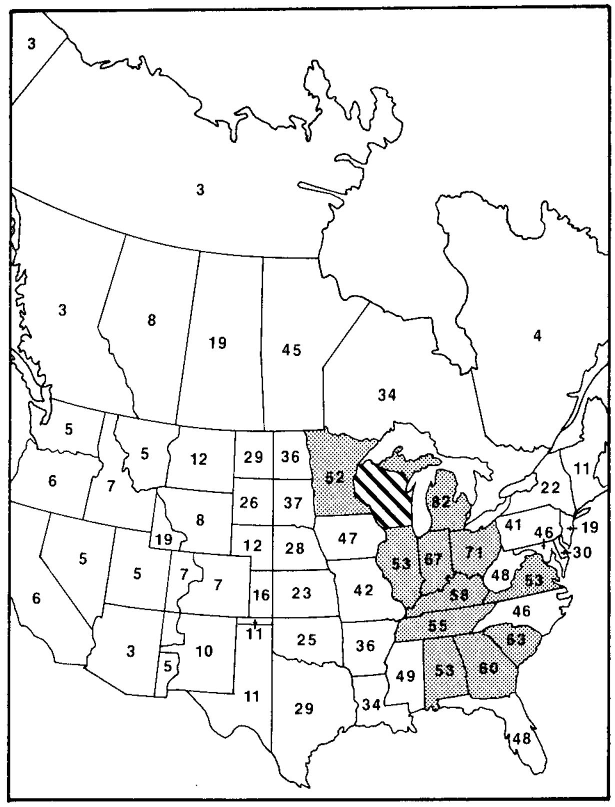

Fig. D-48. Mallard harvest derivation similarity indices for *Wisconsin* (hatched) compared with indices for other harvest areas.

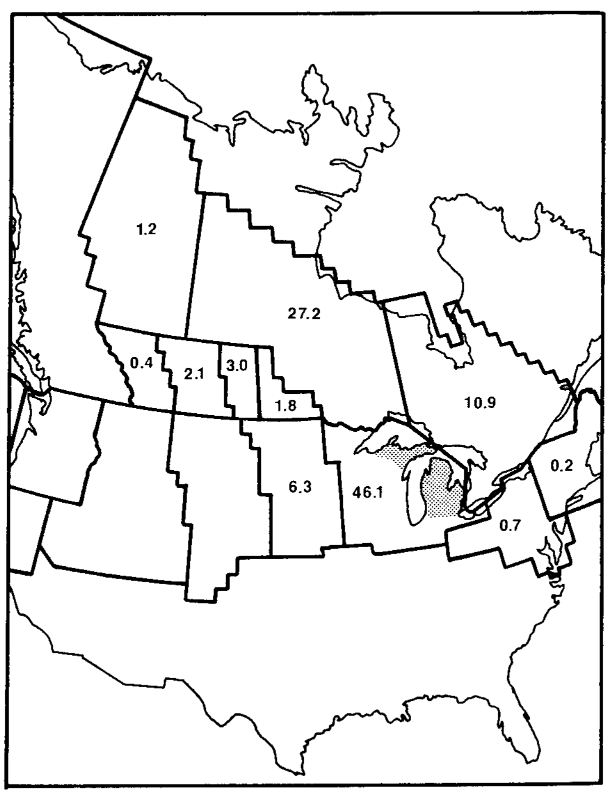

Fig. D-49. Percent derivation of the mallard harvest in *Michigan* (shaded) from major breeding reference areas.

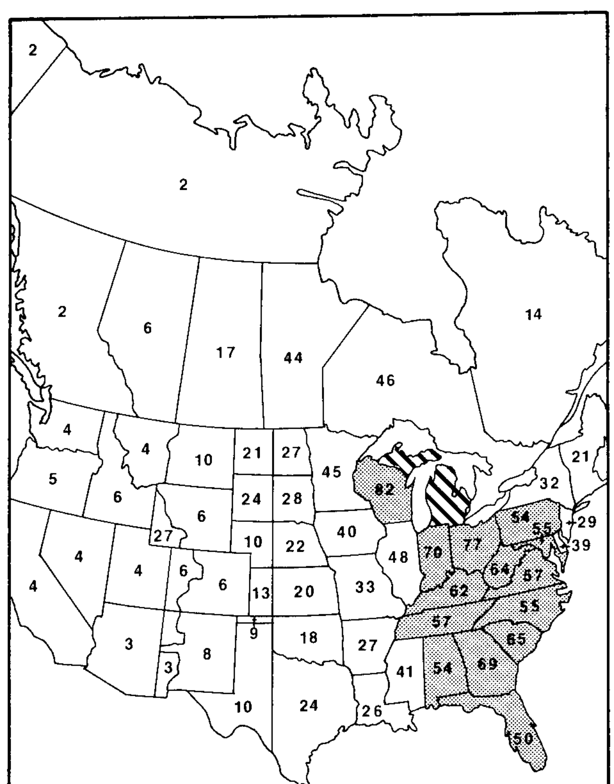

Fig. D-50. Mallard harvest derivation similarity indices for *Michigan* (hatched) compared with indices for other harvest areas.

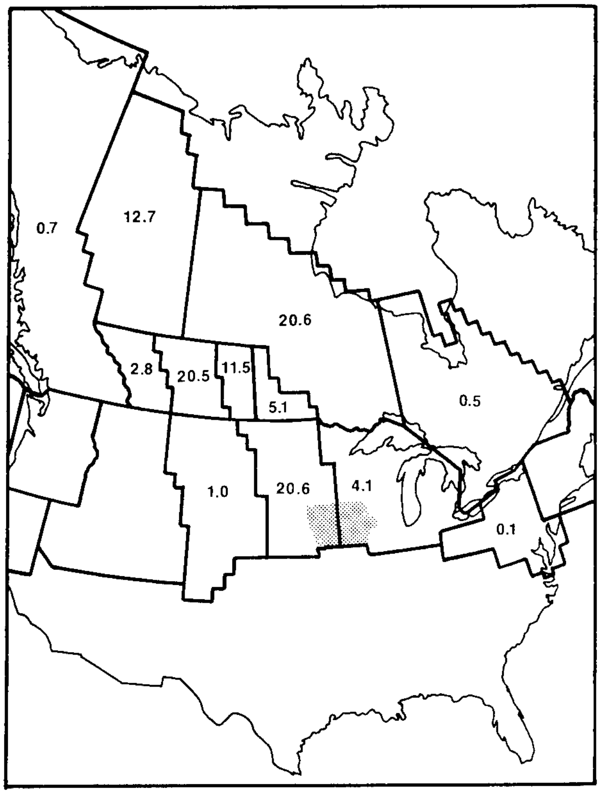

Fig. D-51. Percent derivation of the mallard harvest in *Iowa* (shaded) from major breeding reference areas.

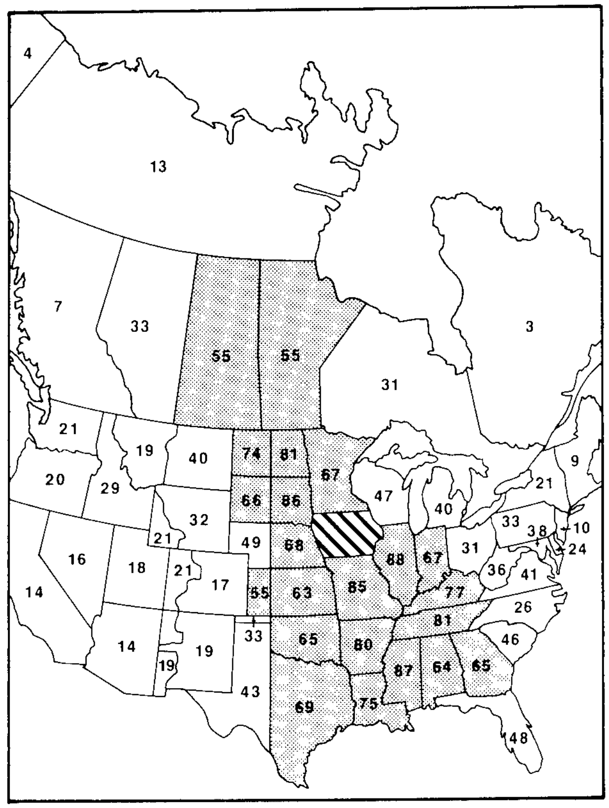

Fig. D-52. Mallard harvest derivation similarity indices for *Iowa* (hatched) compared with indices for other harvest areas.

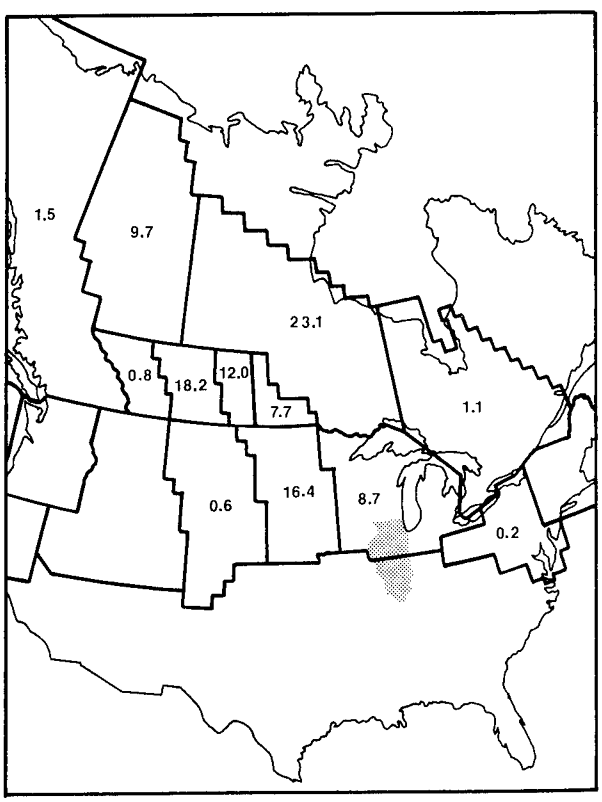

Fig. D-53. Percent derivation of the mallard harvest in *Illinois* (shaded) from major breeding reference areas.

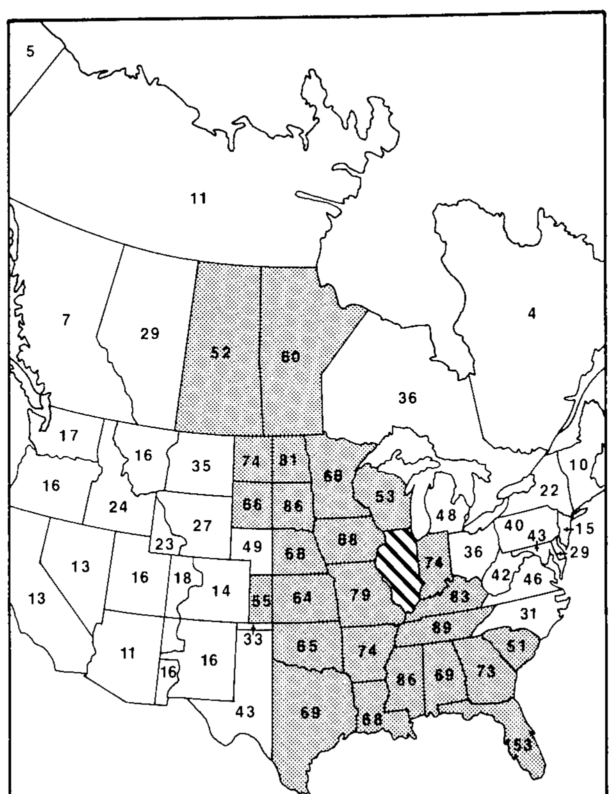

Fig. D-54. Mallard harvest derivation similarity indices for *Illinois* (hatched) compared with indices for other harvest areas.

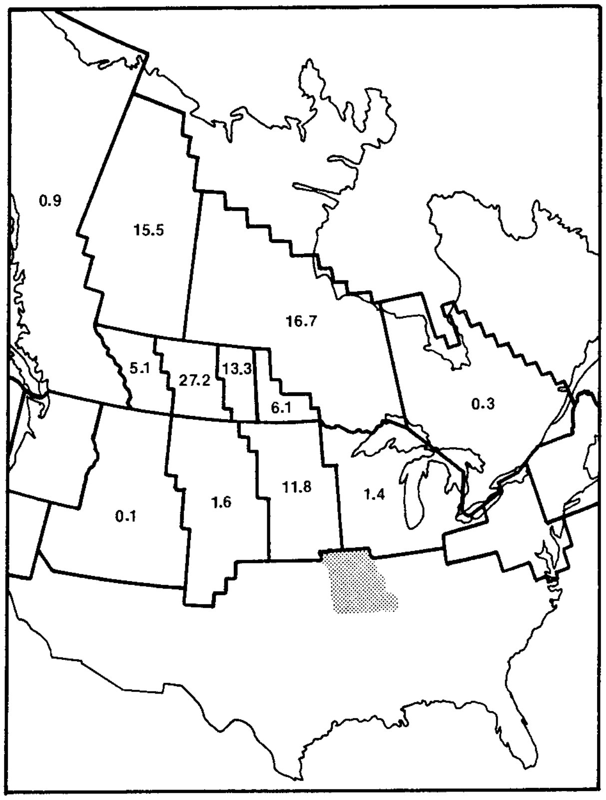

Fig. D-55. Percent derivation of the mallard harvest in *Missouri* (shaded) from major breeding reference areas.

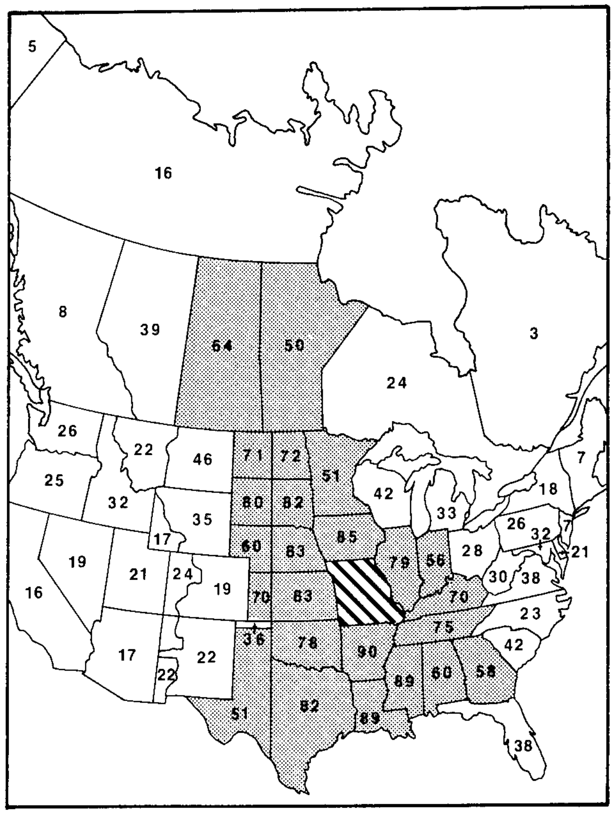

Fig. D-56. Mallard harvest derivation similarity indices for *Missouri* (hatched) compared with indices for other harvest areas.

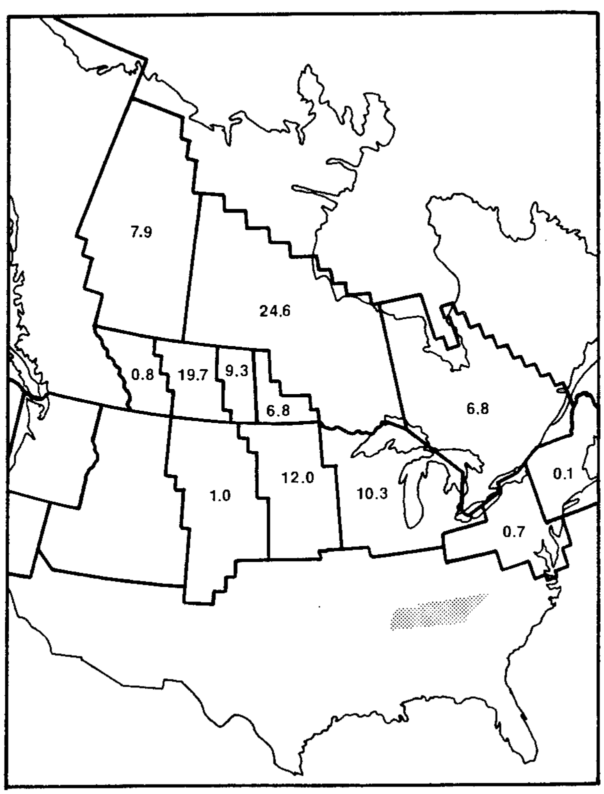

Fig. D-57. Percent derivation of the mallard harvest in *Tennessee* (shaded) from major breeding reference areas.

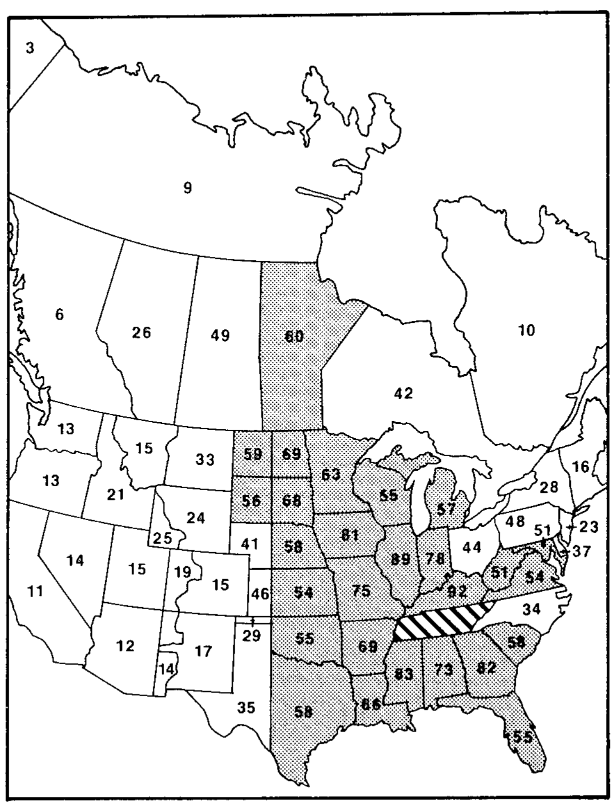

Fig. D-58. Mallard harvest derivation similarity indices for *Tennessee* (hatched) compared with indices for other harvest areas.

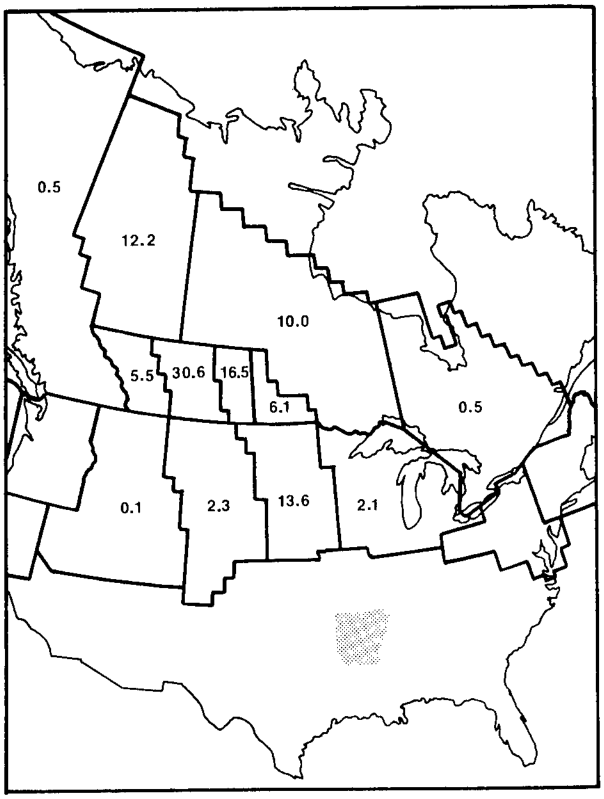

Fig. D-59. Percent derivation of the mallard harvest in *Arkansas* (shaded) from major breeding reference areas.

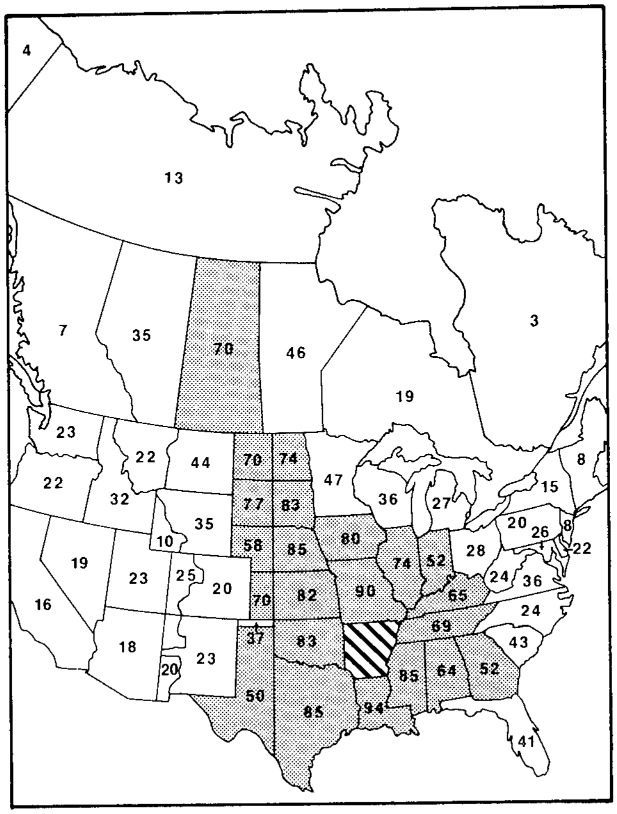

Fig. D-60. Mallard harvest derivation similarity indices for *Arkansas* (hatched) compared with indices for other harvest areas.

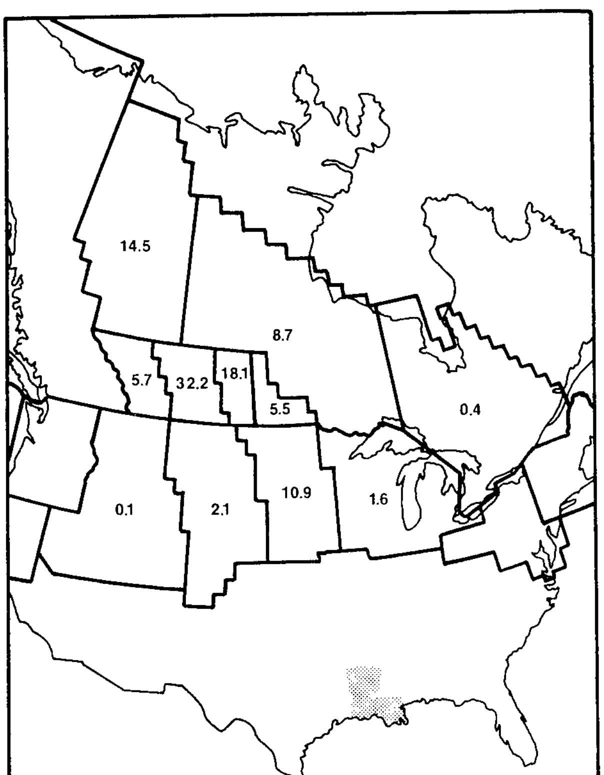

Fig. D-61. Percent derivation of the mallard harvest in *Louisiana* (shaded) from major breeding reference areas.

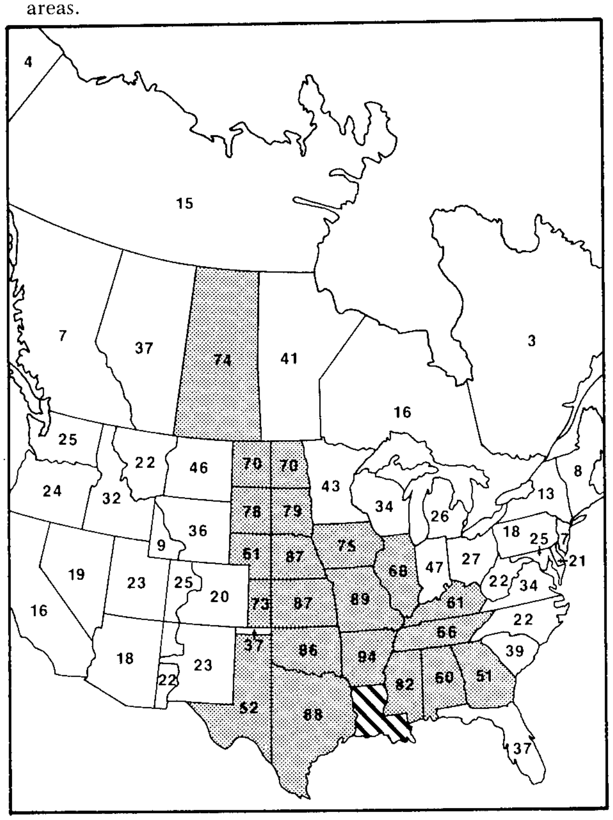

Fig. D-62. Mallard harvest derivation similarity indices for *Louisiana* (hatched) compared with indices for other harvest areas.

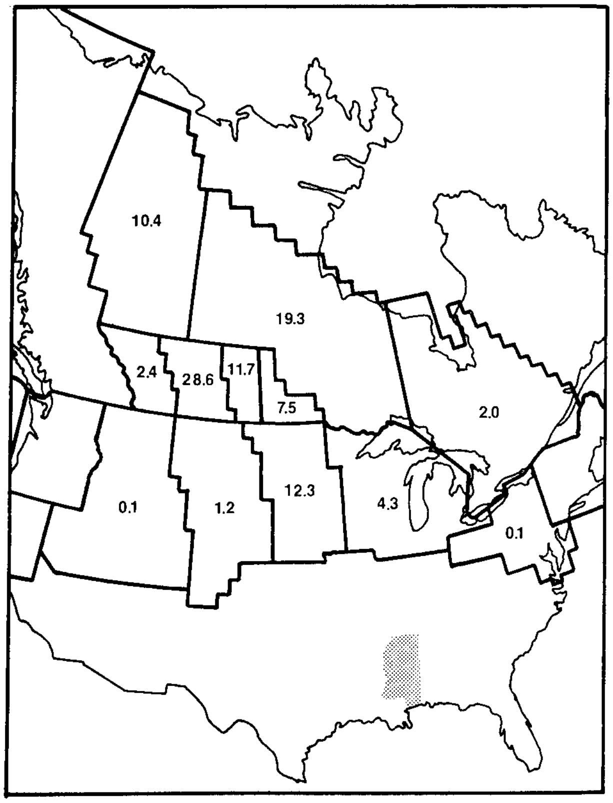

Fig. D-63. Percent derivation of the mallard harvest in *Mississippi* (shaded) from major breeding reference areas.

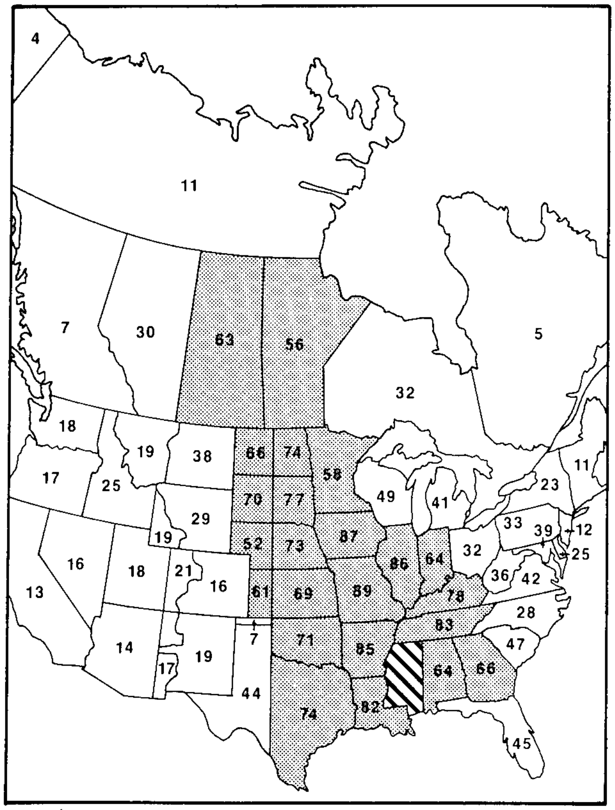

Fig. D-64. Mallard harvest derivation similarity indices for *Mississippi* (hatched) compared with indices for other harvest areas.

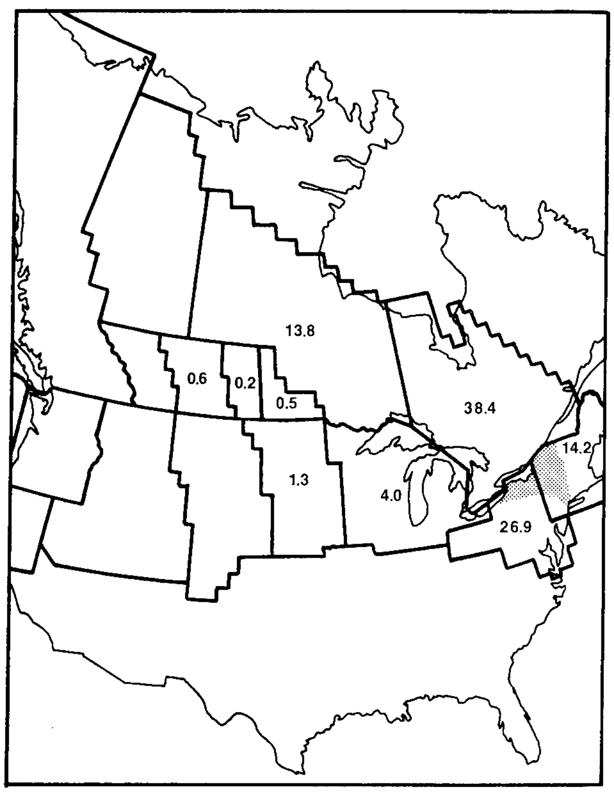

Fig. D-65. Percent derivation of the mallard harvest in *New York* (shaded) from major breeding reference areas.

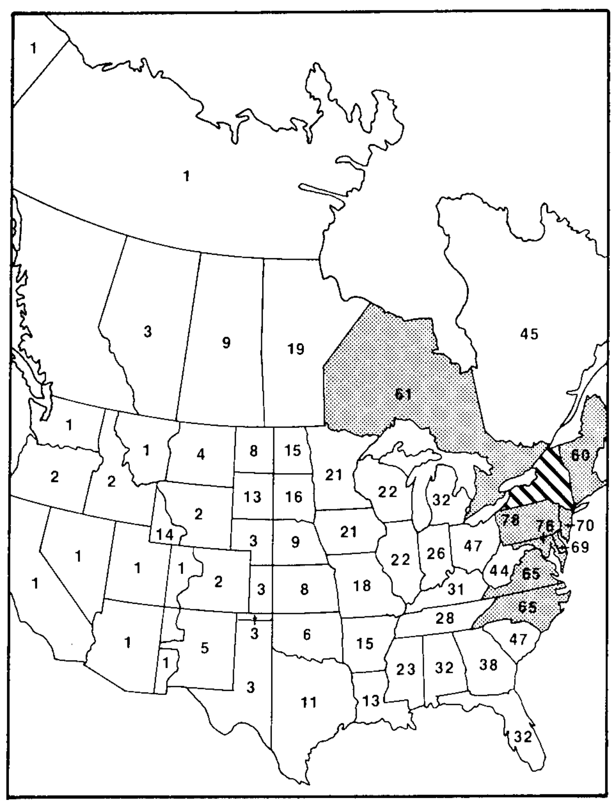

Fig. D-66. Mallard harvest derivation similarity indices for *New York* (hatched) compared with indices for other harvest areas.

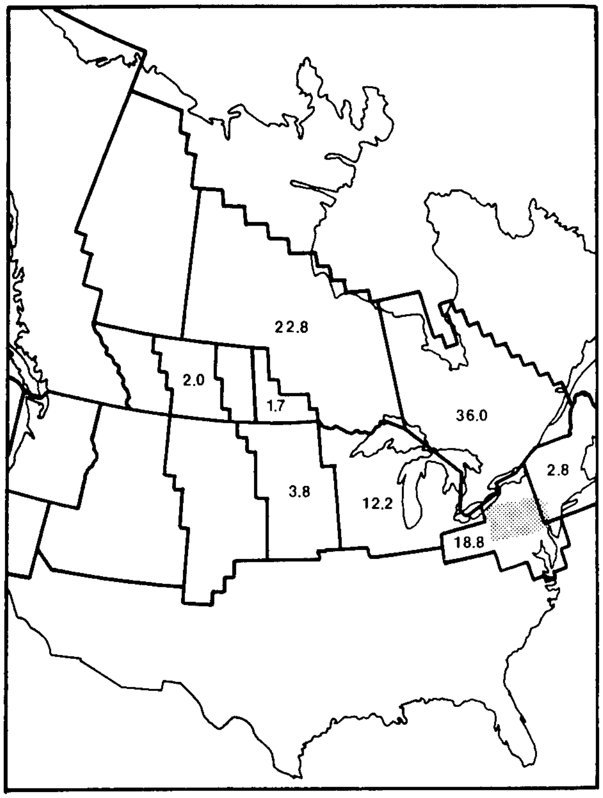

Fig. D-67. Percent derivation of the mallard harvest in *Pennsylvania* (shaded) from major breeding reference areas.

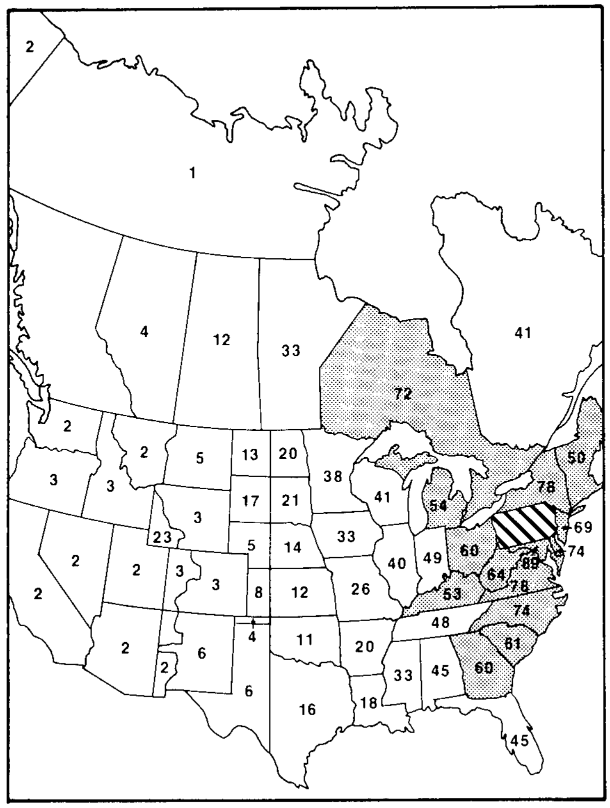

Fig. D-68. Mallard harvest derivation similarity indices for *Pennsylvania* (hatched) compared with indices for other harvest areas.

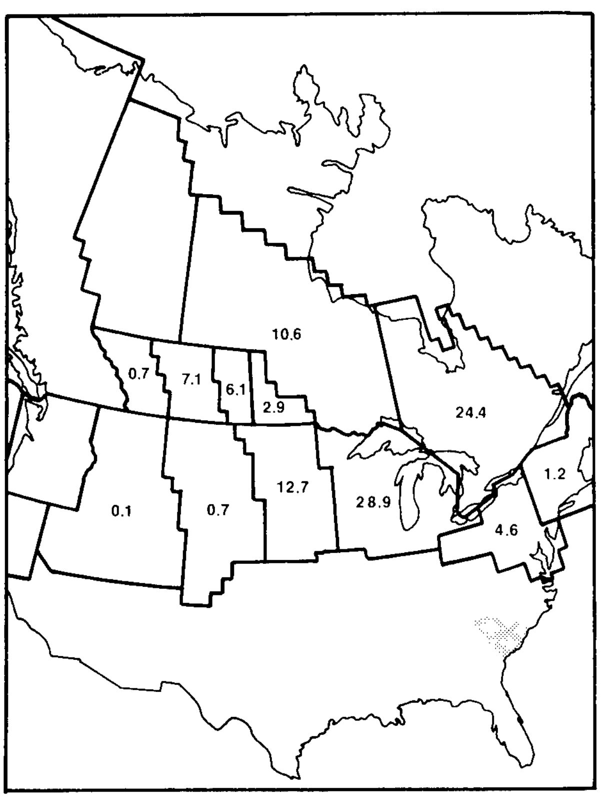

Fig. D-69. Percent derivation of the mallard harvest in *South Carolina* (shaded) from major breeding reference areas.

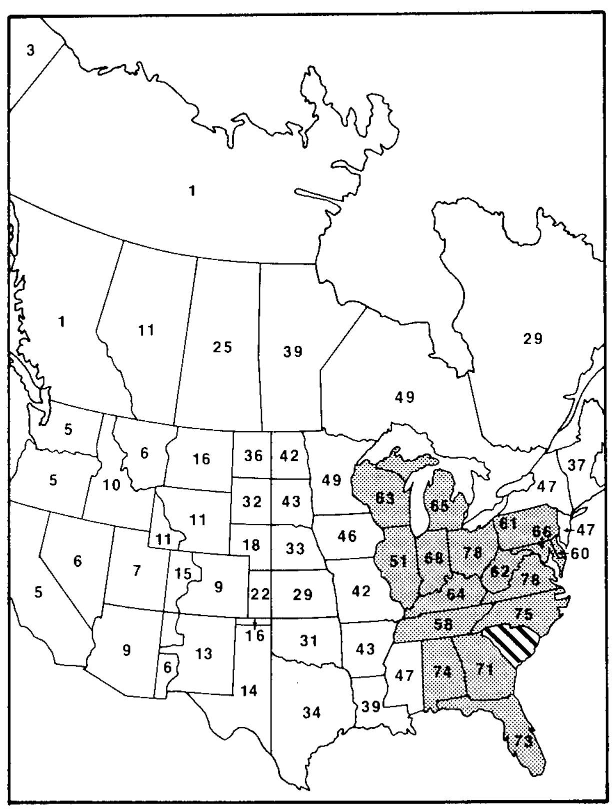

Fig. D-70. Mallard harvest derivation similarity indices for *South Carolina* (hatched) compared with indices for other harvest areas.

Appendix E

Temporal (Within-season) Derivation of the Total Mallard Harvest

Temporal (within-season) derivation of the mallard harvest is estimated here for weekly periods during which we estimate that 1% or more of the area's harvest occurred. Weeks of less importance, as far as harvest levels are concerned, are not tabulated. Temporal derivation of the total mallard harvest was based on 1961–75 recoveries each adjusted for band reporting rate, population weighted, and then measured against the season's harvest and converted to percentages. Week 1, common to all harvest areas, begins on 1 September. These estimates are affected by such factors as annual population fluctuations, changes in banding intensity, hunting pressure, timing of migration, and changes in hunting regulations. Variations in season opening dates and changes to split-season frameworks are of particular concern. For these and other reasons caution must be exercised when interpreting these data. Dates of weekly periods are shown in Table E-1.

Table E-1. Dates of weekly periods that correspond to those shown in Table E-2.

Week	Day and Month
1	1 - 7 September
2	8 - 14 September
3	15 - 21 September
4	22 - 28 September
5	29 September - 5 October
6	6 - 12 October
7	13 - 19 October
8	20 - 26 October
9	27 October - 2 November
10	3 - 9 November
11	10 - 16 November
12	17 - 23 November
13	24 - 30 November
14	1 - 7 December
15	8 - 14 December
16	15 - 21 December
17	22 - 28 December
18	29 December - 4 January
19	5 - 11 January
20	12 - 18 January
21	19 - 25 January
22	26 January - 1 February
23	2 - 8 February
24	9 - 15 February

Table E-2. Temporal derivation of the total mallard harvest by harvest area by week for weeks that contributed 1% or more of the area's harvest (1961-75 hunting seasons combined).[a]

Harvest area	Week	N PAC 1	N N ALTA NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16	Imp
		Major reference area of banding																
AK	1	96.1	0.0	0.0	0.0	0.0	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	48.8
AK	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.1	0.0	0.0	84.9	0.0	0.0	0.0	0.0	1.5
AK	5	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.8
AK	6	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.7
YUK	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.9	44.1	0.0	0.0	0.0	0.0	0.0	0.0	100.0
BC	3	99.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	23.4
BC	4	98.4	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.1
BC	5	97.4	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.5
BC	6	93.2	1.6	2.7	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	13.4
BC	7	95.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	0.1	0.6	0.0	0.3	0.0	0.0	0.0	7.1
BC	8	92.7	4.4	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.2	0.1	0.3	0.0	0.0	0.0	0.0	8.4
BC	9	95.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	0.0	0.7	0.0	0.4	0.0	0.0	0.0	4.7
BC	10	64.2	21.7	5.5	3.1	0.0	0.0	0.0	0.0	5.2	0.0	0.3	0.0	0.0	0.0	0.0	0.0	3.4
BC	11	77.3	14.1	3.8	2.1	0.0	0.5	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0
BC	12	53.2	32.2	9.0	0.0	0.0	0.0	0.0	0.0	4.6	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.9
BC	13	0.0	62.9	21.8	0.0	0.0	0.0	0.0	0.0	10.7	0.0	0.0	2.6	2.1	0.0	0.0	0.0	1.0
BC	14	81.5	16.1	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5
BC	15	84.9	9.2	3.5	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0
BC	18	92.5	0.0	6.8	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7
NWTM	1	0.0	97.5	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.7
NWTM	2	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	59.1
NWTM	3	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.8
ALTA	1	0.0	72.0	7.2	17.5	0.0	0.0	0.0	0.0	0.7	0.0	1.0	1.0	0.5	0.0	0.0	0.0	3.0
ALTA	2	0.0	65.0	16.2	14.5	0.8	0.2	1.2	0.0	0.1	0.0	0.6	0.7	0.8	0.0	0.0	0.0	6.2
ALTA	3	0.0	26.1	64.0	6.5	0.8	0.1	0.0	0.0	0.1	0.0	0.4	1.4	0.7	0.0	0.0	0.0	9.9
ALTA	4	3.2	30.5	51.4	8.8	1.5	0.0	1.0	0.0	0.1	0.0	1.3	1.4	0.5	0.2	0.0	0.0	11.5
ALTA	5	0.0	39.9	42.9	9.9	0.9	0.1	2.9	0.0	0.2	0.2	0.9	1.7	0.3	0.1	0.0	0.0	11.3
ALTA	6	4.3	29.2	45.2	15.9	0.3	0.3	0.5	0.0	0.2	0.1	1.1	1.6	1.2	0.1	0.0	0.0	14.4
ALTA	7	5.9	26.1	47.0	15.4	2.0	0.3	0.0	0.0	0.2	0.1	1.1	1.2	0.6	0.1	0.0	0.0	15.0
ALTA	8	5.5	29.6	38.0	22.1	1.7	0.3	0.0	0.0	0.5	0.0	1.3	0.8	0.3	0.0	0.0	0.0	12.5
ALTA	9	0.0	17.7	59.1	12.6	0.4	0.4	5.1	0.0	0.3	0.1	1.1	1.2	1.7	0.2	0.0	0.0	7.1
ALTA	10	23.5	18.8	42.8	14.2	0.0	0.0	0.0	0.0	0.3	0.0	0.4	0.0	0.0	0.0	0.1	0.0	3.4
ALTA	11	0.0	21.2	68.1	9.3	0.0	0.0	0.0	0.0	0.4	0.0	0.2	0.6	0.3	0.0	0.0	0.0	3.5
SASK	1	0.0	4.2	0.0	70.6	5.9	0.0	17.4	0.2	0.0	0.0	0.0	0.0	1.5	0.2	0.0	0.0	2.3
SASK	2	0.0	2.4	1.7	40.1	39.2	1.2	12.3	0.2	0.0	0.0	0.0	0.8	1.7	0.3	0.0	0.0	5.3
SASK	3	0.0	5.7	0.9	40.5	40.5	1.2	7.8	0.3	0.0	0.0	0.2	1.0	1.5	0.3	0.0	0.0	7.6
SASK	4	0.0	5.4	3.0	51.5	31.4	1.4	4.0	0.1	0.0	0.0	0.2	1.3	1.4	0.3	0.0	0.0	11.3
SASK	5	0.0	9.4	1.6	50.7	28.8	1.0	3.5	0.3	0.1	0.0	0.1	1.8	2.5	0.4	0.0	0.0	12.8

Table E-2. Continued.

Harvest area and week		Major reference area of banding																
		N PAC 1	N N ALTA NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16	Imp
SASK	6	0.0	9.5	0.7	50.1	23.8	2.1	9.6	0.1	0.0	0.0	0.1	1.1	2.4	0.4	0.0	0.0	18.8
SASK	7	0.0	17.7	1.0	44.0	27.7	2.2	2.1	0.1	0.0	0.1	0.1	2.0	2.4	0.6	0.0	0.0	17.8
SASK	8	0.0	11.3	3.1	45.5	26.6	3.0	4.6	0.2	0.0	0.0	0.2	2.6	2.5	0.4	0.0	0.0	12.4
SASK	9	0.0	12.3	0.0	44.8	26.6	2.9	8.4	0.1	0.0	0.0	0.1	1.1	3.4	0.4	0.0	0.0	6.2
SASK	10	0.0	27.8	0.0	42.3	17.6	2.1	4.0	0.1	0.0	0.0	0.3	3.5	2.1	0.4	0.0	0.0	3.1
SASK	11	0.0	17.6	5.9	43.0	25.4	2.3	0.0	0.0	0.2	0.0	0.0	2.9	2.7	0.1	0.0	0.0	1.8
MAN	2	0.0	0.0	0.0	0.0	0.0	49.0	47.9	0.2	0.0	0.0	0.0	0.9	1.1	0.7	0.0	0.0	3.3
MAN	3	0.0	0.0	0.0	1.2	3.6	15.4	76.5	0.0	0.0	0.0	0.0	1.2	1.9	0.1	0.0	0.0	7.6
MAN	4	0.0	4.3	0.0	3.1	3.1	53.3	26.2	0.4	0.0	0.0	0.0	0.3	6.5	2.7	0.0	0.1	10.1
MAN	5	0.0	3.6	2.8	7.2	6.7	45.8	15.9	0.6	0.0	0.0	0.0	0.0	15.7	1.7	0.0	0.0	16.6
MAN	6	0.0	2.8	0.5	3.4	4.4	37.8	33.6	0.7	0.1	0.0	0.0	0.5	14.7	1.3	0.1	0.0	23.9
MAN	7	0.0	3.8	0.0	3.2	2.3	46.2	23.9	0.6	0.0	0.0	0.0	1.8	15.9	2.3	0.1	0.0	15.6
MAN	8	0.0	8.3	2.7	8.3	8.3	42.0	10.6	0.4	0.0	0.0	0.0	0.8	16.2	2.3	0.1	0.1	9.0
MAN	9	0.0	10.0	0.0	1.3	0.0	40.2	26.6	0.6	0.0	0.0	0.0	0.4	18.1	2.8	0.0	0.0	6.8
MAN	10	0.0	0.0	3.3	4.6	9.6	26.2	35.9	0.0	0.0	0.0	0.0	0.0	19.1	1.3	0.1	0.0	3.7
MAN	11	0.0	0.0	5.1	2.7	20.9	16.9	42.6	0.0	0.0	0.0	0.0	2.1	9.2	0.5	0.0	0.0	2.4
ONT	3	0.0	0.0	0.0	0.0	0.0	0.0	65.5	26.5	0.0	0.0	0.0	0.0	3.5	3.4	0.5	0.6	6.9
ONT	4	0.0	0.0	0.0	0.0	0.0	0.3	19.8	73.4	0.0	0.0	0.0	0.0	0.8	2.8	0.7	2.2	15.5
ONT	5	0.0	0.0	0.0	0.0	0.0	0.2	9.8	81.3	0.0	0.0	0.0	0.0	2.0	4.3	0.9	1.5	15.9
ONT	6	0.0	0.0	0.0	0.0	0.0	0.9	13.7	72.5	0.0	0.0	0.0	0.0	2.9	7.3	1.0	1.6	12.3
ONT	7	0.0	0.0	0.0	1.7	6.1	1.3	19.9	58.1	0.1	0.0	0.3	0.0	4.3	6.0	1.1	1.3	10.2
ONT	8	0.0	0.0	0.0	1.3	0.0	0.3	30.2	56.9	0.0	0.0	0.0	0.0	4.1	5.5	0.9	0.8	9.1
ONT	9	0.0	0.0	0.0	0.0	4.2	1.2	21.7	56.4	0.0	0.0	0.0	0.0	6.2	7.7	1.3	1.3	5.8
ONT	10	0.0	0.0	0.0	0.0	0.0	0.9	5.7	72.4	0.0	0.0	0.0	0.0	6.7	11.4	1.5	1.3	4.5
ONT	11	0.0	0.0	0.0	1.5	0.0	2.1	34.2	52.0	0.0	0.0	0.0	0.0	1.8	5.8	1.5	1.1	5.6
ONT	12	0.0	0.0	0.0	4.9	0.0	1.7	0.0	73.7	0.0	0.0	0.0	0.0	2.3	13.0	3.4	0.9	3.2
ONT	13	0.0	0.0	0.0	6.1	0.0	0.0	0.0	64.2	0.0	0.0	0.0	0.0	4.5	20.2	2.1	2.9	2.5
ONT	14	0.0	3.4	0.0	0.0	0.0	0.0	37.0	48.5	0.0	0.0	0.0	0.0	1.9	7.5	1.1	0.5	3.5
ONT	15	0.0	0.0	0.0	0.0	0.0	2.0	33.8	50.7	0.0	0.0	0.0	0.9	2.1	8.9	0.8	0.9	3.1
ONT	16	0.0	0.0	0.0	0.0	0.0	0.0	72.1	17.9	0.0	0.0	0.0	0.0	1.8	7.1	0.3	0.8	1.4
QUE	3	0.0	0.0	0.0	0.0	0.0	0.5	0.0	91.7	0.0	0.0	0.0	0.0	1.0	0.1	0.9	5.8	22.4
QUE	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	93.2	0.0	0.0	0.0	0.0	0.0	1.8	0.7	4.4	18.9
QUE	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	96.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9	2.9	13.4
QUE	6	0.0	0.0	0.0	0.0	0.0	0.0	6.7	88.0	0.0	0.0	0.0	0.0	0.0	0.5	0.4	4.5	15.0
QUE	7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	96.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	8.6
QUE	8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	91.5	0.0	0.0	0.0	0.0	0.0	0.0	1.2	7.3	5.3
QUE	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	92.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.4	3.8
QUE	10	0.0	0.0	0.0	0.0	0.0	9.4	0.0	78.4	0.0	0.0	0.0	0.0	0.0	3.6	0.0	8.6	3.2
QUE	11	0.0	0.0	22.0	0.0	0.0	0.0	0.0	75.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	4.9
QUE	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	93.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.6	1.0
QUE	14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	94.5	0.0	0.0	0.0	0.0	0.0	4.1	0.0	1.4	1.2

Table E-2. Continued.

Harvest area and week		N PAC 1	N ALTA N NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16	Imp
		Major reference area of banding																
N B	5	0.0	0.0	90.4	0.0	0.0	0.0	0.0	9.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	82.6
N B	7	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.9
N B	8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.1	0.0	0.0	0.0	0.0	0.0	0.0	45.9	0.0	2.2
N B	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	1.7
PEI	8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	92.0
PEI	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	8.0
N S	7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	84.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.7	25.6
N S	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	3.3
N S	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	66.8
N S	18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	4.4
WA	6	47.8	6.7	4.0	0.0	0.0	0.0	0.0	0.0	36.1	1.9	2.0	1.5	0.0	0.0	0.0	0.0	1.8
WA	7	58.8	3.1	4.3	2.2	0.0	0.0	0.0	0.0	29.7	0.6	0.8	0.4	0.1	0.0	0.0	0.0	9.3
WA	8	27.4	17.4	6.6	5.2	0.0	0.4	0.0	0.0	41.5	0.2	0.7	0.2	0.3	0.0	0.0	0.0	3.3
WA	9	45.0	21.7	8.5	2.1	0.0	0.0	0.0	0.0	19.3	0.5	2.6	0.0	0.3	0.0	0.0	0.0	3.4
WA	10	41.8	20.6	13.0	7.7	0.0	0.0	0.0	0.0	14.9	0.4	0.7	0.8	0.0	0.0	0.0	0.0	4.9
WA	11	42.6	27.2	16.4	2.5	0.0	0.0	0.0	0.0	10.3	0.1	0.9	0.0	0.0	0.0	0.0	0.0	9.0
WA	12	18.7	37.9	23.5	4.0	0.0	0.0	0.0	0.0	13.5	0.2	2.0	0.2	0.0	0.0	0.0	0.0	7.1
WA	13	25.2	34.2	24.6	4.0	0.0	0.0	0.0	0.0	10.4	0.2	1.0	0.4	0.0	0.0	0.0	0.0	7.9
WA	14	15.6	26.5	39.5	3.6	0.0	0.0	0.0	0.0	11.7	0.1	2.8	0.2	0.0	0.0	0.0	0.0	5.8
WA	15	18.4	42.6	16.1	6.9	0.0	0.0	0.0	0.0	13.5	0.0	2.0	0.2	0.3	0.1	0.0	0.0	6.0
WA	16	28.2	25.0	25.2	8.0	0.0	0.0	0.0	0.0	11.0	0.2	1.8	0.2	0.3	0.0	0.0	0.0	7.3
WA	17	40.9	20.9	25.0	3.1	0.0	0.0	0.0	0.0	8.4	0.5	1.1	0.2	0.0	0.0	0.0	0.0	9.1
WA	18	16.7	22.2	38.2	5.4	0.0	0.1	0.0	0.0	14.1	0.4	2.2	0.3	0.2	0.0	0.0	0.0	5.8
WA	19	45.0	14.9	23.7	4.2	0.0	0.0	0.0	0.0	10.5	0.0	1.5	0.0	0.1	0.0	0.0	0.0	7.2
WA	20	39.8	28.7	13.4	6.5	0.0	0.0	0.0	0.0	9.3	0.2	1.9	0.2	0.1	0.0	0.0	0.0	6.8
WA	21	55.6	12.2	20.6	4.0	0.0	0.3	0.0	0.0	5.7	0.0	1.2	0.4	0.0	0.0	0.0	0.0	4.5
OR	6	0.0	3.6	0.0	0.0	0.0	0.0	0.0	0.0	79.5	14.1	2.4	0.0	0.3	0.0	0.0	0.0	3.8
OR	7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	80.3	14.8	4.9	0.0	0.0	0.0	0.0	0.0	3.7
OR	8	0.0	0.0	4.1	0.0	0.0	0.0	0.0	0.0	79.0	11.7	5.2	0.0	0.0	0.0	0.0	0.0	3.0
OR	9	0.0	5.6	14.1	0.0	0.0	0.0	0.0	0.0	59.6	16.1	4.6	0.0	0.0	0.0	0.0	0.0	2.5
OR	10	13.4	29.9	3.1	0.0	0.0	0.0	0.0	0.0	38.7	9.0	4.5	1.5	0.0	0.0	0.0	0.0	3.9
OR	11	38.4	11.9	19.1	6.8	0.0	0.0	0.0	0.0	16.3	5.9	1.6	0.0	0.0	0.0	0.0	0.0	8.6
OR	12	43.7	12.5	14.4	5.6	0.0	0.0	0.0	0.0	18.4	4.2	1.2	0.0	0.0	0.0	0.0	0.0	7.3
OR	13	37.1	17.3	16.6	3.7	0.0	0.0	0.0	0.0	18.5	2.7	3.0	1.1	0.0	0.0	0.0	0.0	8.2
OR	14	12.6	17.1	30.3	3.6	0.0	0.0	0.0	0.0	25.1	5.0	6.1	0.4	0.0	0.0	0.0	0.0	6.3
OR	15	56.7	10.6	14.0	2.1	0.0	0.0	0.0	0.0	10.9	2.3	2.8	0.2	0.3	0.0	0.0	0.0	11.2
OR	16	40.5	15.1	11.9	0.6	0.0	0.0	0.0	0.0	25.5	2.4	3.9	0.0	0.0	0.0	0.0	0.0	7.8
OR	17	39.6	16.2	22.6	2.2	0.0	0.0	0.0	0.0	12.4	3.0	3.1	0.8	0.1	0.0	0.0	0.0	10.2
OR	18	56.6	10.9	8.6	3.6	0.0	0.1	6.1	0.0	9.4	1.4	2.8	0.4	0.0	0.1	0.0	0.0	15.1

Table E-2. Continued.

Harvest area and week	Major reference area of banding: N PAC 1	N N ALTA NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16	Imp
OR 19	0.0	27.9	35.4	6.3	0.0	0.0	0.0	0.0	19.7	4.0	6.7	0.0	0.0	0.0	0.0	0.0	4.4
OR 20	0.0	34.8	42.6	3.0	0.0	0.6	0.0	0.0	11.9	2.4	4.6	0.0	0.0	0.0	0.0	0.0	2.7
OR 21	0.0	36.5	46.5	0.0	0.0	0.0	0.0	0.0	12.1	0.0	4.9	0.0	0.0	0.0	0.0	0.0	1.1
ID 6	19.7	0.0	7.7	2.2	2.0	0.0	0.0	0.1	2.4	0.0	59.3	6.3	0.4	0.0	0.0	0.0	5.5
ID 7	41.8	7.1	13.4	0.0	0.0	0.0	0.0	0.0	1.0	0.0	35.0	1.6	0.0	0.0	0.0	0.0	5.1
ID 8	0.0	12.7	13.5	3.3	0.0	0.0	0.0	0.0	1.9	0.0	64.4	3.1	1.1	0.0	0.0	0.0	2.1
ID 9	0.0	22.4	24.1	5.8	2.8	0.0	0.0	0.0	2.1	0.3	38.4	3.5	0.6	0.0	0.0	0.0	3.9
ID 10	0.0	8.9	37.8	3.6	0.0	0.0	0.0	0.0	0.2	0.5	47.1	2.0	0.0	0.0	0.0	0.0	2.9
ID 11	0.0	34.9	17.4	16.0	0.0	0.0	0.0	0.0	1.5	0.2	29.3	0.8	0.0	0.0	0.0	0.0	4.6
ID 12	0.0	21.8	33.8	7.8	5.5	0.0	0.0	0.0	1.2	0.0	28.6	0.7	0.6	0.0	0.0	0.0	6.0
ID 13	0.0	21.0	29.5	15.8	0.0	0.3	0.0	0.0	1.8	0.2	28.4	2.7	0.3	0.1	0.0	0.0	7.4
ID 14	0.0	13.3	40.6	11.7	0.0	0.0	0.0	0.0	1.5	0.2	32.0	0.7	0.0	0.0	0.0	0.0	6.2
ID 15	9.7	6.0	37.8	14.2	0.0	0.0	9.0	0.0	1.2	0.2	21.1	0.8	0.0	0.0	0.0	0.0	8.8
ID 16	0.0	12.8	44.0	7.7	1.3	0.2	0.0	0.0	1.2	0.1	29.3	2.8	0.3	0.2	0.0	0.0	8.6
ID 17	0.0	10.4	41.0	8.3	2.4	0.2	0.0	0.0	2.1	0.5	33.2	1.7	0.0	0.0	0.0	0.0	9.2
ID 18	18.7	12.3	31.6	7.3	0.0	0.0	0.0	0.0	1.0	0.3	27.2	1.6	0.0	0.0	0.0	0.0	10.7
ID 19	9.4	23.2	29.3	12.5	1.1	0.0	1.0	0.0	0.7	0.1	21.9	0.8	0.0	0.0	0.0	0.0	10.5
ID 20	0.0	7.2	58.5	7.7	0.0	0.0	0.0	0.0	0.5	0.5	23.9	1.1	0.4	0.0	0.0	0.0	4.8
ID 21	0.0	13.4	50.7	14.0	0.0	0.0	0.0	0.0	2.1	0.9	17.3	1.6	0.0	0.0	0.0	0.0	2.5
MT-W 5	0.0	0.0	20.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	79.8	0.0	0.0	0.0	0.0	0.0	6.8
MT-W 6	0.0	7.7	22.4	0.0	0.0	0.0	0.0	0.0	0.1	0.0	69.3	0.5	0.0	0.0	0.0	0.0	15.3
MT-W 7	0.0	0.0	15.5	4.9	0.0	0.0	0.0	0.0	0.0	0.0	78.7	0.8	0.0	0.0	0.0	0.0	7.8
MT-W 8	0.0	0.0	15.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	84.4	0.0	0.0	0.0	0.0	0.0	8.8
MT-W 9	0.0	0.0	16.3	6.8	0.0	0.0	0.0	0.0	0.0	0.0	77.0	0.0	0.0	0.0	0.0	0.0	5.2
MT-W 10	0.0	14.2	14.4	6.4	0.0	0.0	0.0	0.0	0.0	0.0	64.9	0.0	0.0	0.0	0.0	0.0	5.8
MT-W 11	0.0	32.7	19.3	4.6	0.0	0.0	0.0	0.0	0.0	0.0	41.6	1.8	0.0	0.0	0.0	0.0	8.0
MT-W 12	0.0	17.0	39.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.9	0.0	0.0	0.0	0.0	0.0	4.9
MT-W 13	0.0	0.0	59.6	4.3	0.0	0.0	0.0	0.0	0.0	0.0	36.0	0.0	0.0	0.0	0.0	0.0	5.6
MT-W 14	0.0	28.1	34.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37.4	0.0	0.0	0.0	0.0	0.0	6.8
MT-W 15	0.0	24.7	45.6	12.2	0.0	0.0	0.0	0.0	0.0	0.0	17.6	0.0	0.0	0.0	0.0	0.0	9.4
MT-W 16	0.0	0.0	25.6	26.7	0.0	0.0	0.0	0.0	0.0	0.0	45.3	0.0	2.4	0.0	0.0	0.0	5.2
MT-W 17	0.0	0.0	30.1	9.2	0.0	0.0	0.0	0.0	0.0	0.0	55.8	4.9	0.0	0.0	0.0	0.0	6.0
MT-W 18	0.0	0.0	27.5	21.1	0.0	0.0	0.0	0.0	2.9	0.0	40.0	8.5	0.0	0.0	0.0	0.0	3.2
MT-W 19	0.0	79.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.6	0.0	0.0	0.0	0.0	0.0	1.2
WY-W 7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	11.7
WY-W 9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	13.1
WY-W 11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	23.0
WY-W 13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	12.2
WY-W 14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	40.0
CA 6	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.0	1.5	95.3	0.8	0.0	0.0	0.0	0.0	0.0	3.3

Table E-2. Continued.

Harvest area and week		Major reference area of banding: N PAC 1	N N ALTA NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16	Imp
CA	7	15.8	0.0	0.0	1.0	0.0	0.0	0.0	0.0	2.8	77.0	3.0	0.3	0.0	0.0	0.0	0.0	5.4
CA	8	0.0	2.6	2.0	1.0	2.2	0.0	0.0	0.0	5.3	85.4	1.5	0.0	0.0	0.0	0.0	0.0	6.1
CA	9	15.7	4.8	2.3	1.5	0.0	1.0	0.0	0.0	3.5	69.8	0.7	0.6	0.0	0.0	0.0	0.0	5.2
CA	10	0.0	5.9	12.0	3.7	0.0	0.0	0.0	0.0	6.0	67.6	4.3	0.6	0.0	0.0	0.0	0.0	4.8
CA	11	0.0	9.9	10.6	5.8	1.8	0.0	0.0	0.0	8.6	59.5	3.7	0.0	0.0	0.0	0.0	0.0	6.8
CA	12	0.0	3.5	0.0	2.5	0.0	0.0	0.0	0.0	10.2	79.0	3.9	1.0	0.0	0.0	0.0	0.0	4.8
CA	13	0.0	0.0	22.8	0.0	0.0	0.0	0.0	0.0	11.4	60.2	5.2	0.5	0.0	0.0	0.0	0.0	5.4
CA	14	0.0	7.4	16.5	0.0	0.0	0.0	0.0	0.0	10.5	57.4	7.0	0.4	0.8	0.0	0.0	0.0	6.2
CA	15	25.9	1.7	9.2	0.0	0.0	0.0	0.0	0.0	11.0	47.1	4.7	0.0	0.3	0.0	0.0	0.0	8.0
CA	16	0.0	4.8	20.9	1.3	0.0	0.0	0.0	0.0	10.8	55.8	5.5	0.9	0.0	0.0	0.0	0.0	8.2
CA	17	27.9	2.5	10.2	2.3	0.7	0.0	0.0	0.0	8.5	42.5	4.9	0.6	0.0	0.0	0.0	0.0	9.8
CA	18	5.5	8.0	11.5	8.7	0.0	0.4	0.0	0.0	9.6	48.0	7.8	0.4	0.3	0.0	0.0	0.0	9.4
CA	19	17.5	15.7	8.6	6.0	0.0	0.0	0.0	0.0	8.8	38.9	3.6	0.9	0.0	0.0	0.0	0.0	10.1
CA	20	17.9	11.2	14.6	3.6	0.0	0.0	0.0	0.0	6.5	44.8	1.5	0.0	0.0	0.0	0.0	0.0	5.2
NV	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.9	3.8	83.2	0.0	0.0	0.0	0.0	0.0	2.1
NV	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	2.4	93.8	2.9	0.0	0.0	0.0	0.0	12.1
NV	7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.7	92.7	4.7	0.0	0.0	0.0	0.0	10.9
NV	8	0.0	32.5	8.1	0.0	0.0	0.0	0.0	0.0	3.4	1.4	54.6	0.0	0.0	0.0	0.0	0.0	6.8
NV	9	0.0	0.0	33.7	17.0	0.0	0.0	0.0	0.0	1.6	0.0	47.6	0.0	0.0	0.0	0.0	0.0	5.5
NV	10	0.0	21.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8	0.0	68.3	4.9	0.0	0.0	0.0	0.0	3.7
NV	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	4.3
NV	12	0.0	0.0	25.5	7.1	0.0	0.0	0.0	0.0	5.0	0.0	62.4	0.0	0.0	0.0	0.0	0.0	7.0
NV	13	0.0	0.0	0.0	23.4	0.0	0.0	0.0	0.0	1.2	0.8	69.7	4.8	0.0	0.0	0.0	0.0	7.8
NV	14	0.0	0.0	0.0	23.2	0.0	0.0	0.0	0.0	9.3	0.0	65.4	2.1	0.0	0.0	0.0	0.0	6.9
NV	15	0.0	0.0	48.3	0.0	0.0	0.0	0.0	0.0	1.4	0.0	48.2	2.1	0.0	0.0	0.0	0.0	7.0
NV	16	0.0	44.5	0.0	0.0	0.0	0.0	0.0	0.0	5.8	0.0	49.7	0.0	0.0	0.0	0.0	0.0	6.7
NV	17	0.0	0.0	26.9	7.9	0.0	0.0	0.0	0.0	5.3	6.2	53.7	0.0	0.0	0.0	0.0	0.0	7.2
NV	18	0.0	0.0	56.6	0.0	0.0	0.0	0.0	0.0	6.5	3.5	33.5	0.0	0.0	0.0	0.0	0.0	6.6
NV	19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	7.4	89.1	0.0	0.0	0.0	0.0	0.0	1.6
NV	20	0.0	66.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.7	0.0	0.0	0.0	0.0	0.0	3.2
UTAH	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	92.5	7.5	0.0	0.0	0.0	0.0	4.0
UTAH	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	89.0	10.8	0.0	0.0	0.0	0.0	17.4
UTAH	7	0.0	0.0	4.8	0.0	0.0	1.2	0.0	0.0	0.0	0.0	87.2	6.7	0.0	0.0	0.0	0.0	10.6
UTAH	8	0.0	18.8	44.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.5	4.1	0.0	0.8	0.0	0.0	4.5
UTAH	9	0.0	0.0	11.0	24.6	0.0	0.0	0.0	0.0	0.0	0.0	61.7	2.8	0.0	0.0	0.0	0.0	5.3
UTAH	10	0.0	25.6	7.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	55.5	10.5	0.0	0.0	0.0	0.0	4.5
UTAH	11	0.0	0.0	16.8	0.0	0.0	2.5	0.0	0.0	2.6	0.0	46.9	31.2	0.0	0.0	0.0	0.0	2.7
UTAH	12	0.0	51.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.3	7.8	0.0	0.0	0.0	0.0	3.2
UTAH	13	0.0	7.7	12.1	7.4	0.0	0.0	0.0	0.0	0.0	0.0	49.2	23.7	0.0	0.0	0.0	0.0	5.0
UTAH	14	0.0	36.3	15.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.6	1.7	0.0	0.0	0.0	0.0	7.8
UTAH	15	0.0	0.0	23.8	3.9	0.0	0.0	0.0	0.0	1.3	0.0	62.3	6.0	2.7	0.0	0.0	0.0	4.8
UTAH	16	0.0	12.8	11.1	17.9	0.0	0.0	0.0	0.0	0.0	0.0	49.6	8.6	0.0	0.0	0.0	0.0	9.4

Table E-2. Continued.

Harvest area and week	N PAC 1	N N ALTA NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16	Imp
UTAH 17	0.0	13.3	16.1	2.1	0.0	0.0	0.0	0.0	0.0	0.0	59.2	9.3	0.0	0.0	0.0	0.0	9.3
UTAH 18	0.0	12.3	30.7	8.6	0.0	0.0	0.0	0.0	0.0	0.0	38.9	9.5	0.0	0.0	0.0	0.0	10.1
UTAH 19	0.0	0.0	76.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.0	5.6	0.0	0.0	0.0	0.0	1.3
CO-W 5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	5.1
CO-W 6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	6.1
CO-W 7	0.0	0.0	0.0	40.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	59.6	0.0	0.0	0.0	0.0	4.7
CO-W 8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	1.7
CO-W 9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	3.5
CO-W 10	0.0	0.0	54.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	41.7	0.0	0.0	0.0	0.0	16.1
CO-W 11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6	95.4	0.0	0.0	0.0	0.0	7.8
CO-W 12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	6.7
CO-W 13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.7	92.3	0.0	0.0	0.0	0.0	9.4
CO-W 14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.8	69.2	0.0	0.0	0.0	0.0	2.5
CO-W 15	0.0	0.0	0.0	0.0	75.9	0.0	0.0	0.0	0.0	0.0	5.8	11.1	7.2	0.0	0.0	0.0	8.6
CO-W 16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	6.3
CO-W 17	0.0	0.0	18.9	46.6	0.0	0.0	0.0	0.0	0.0	0.0	7.0	27.5	0.0	0.0	0.0	0.0	9.0
CO-W 18	0.0	0.0	0.0	44.4	0.0	0.0	0.0	0.0	0.0	0.0	6.6	48.9	0.0	0.0	0.0	0.0	9.5
CO-W 20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	1.3
AZ 5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	2.3
AZ 8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	1.2
AZ 9	0.0	0.0	73.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.5	19.0	0.0	0.0	0.0	0.0	9.1
AZ 12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	66.6	33.4	0.0	0.0	0.0	0.0	1.6
AZ 13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37.9	62.1	0.0	0.0	0.0	0.0	8.8
AZ 14	0.0	0.0	25.9	0.0	0.0	0.0	0.0	0.0	6.1	0.0	29.8	38.2	0.0	0.0	0.0	0.0	8.0
AZ 15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	3.3
AZ 16	0.0	0.0	0.0	34.4	0.0	0.0	0.0	0.0	0.0	0.0	45.0	20.6	0.0	0.0	0.0	0.0	12.3
AZ 17	0.0	0.0	29.9	17.4	0.0	0.0	0.0	0.0	4.2	0.0	22.5	26.0	0.0	0.0	0.0	0.0	12.6
AZ 18	0.0	0.0	0.0	18.8	0.0	0.0	0.0	0.0	0.0	0.0	37.9	43.3	0.0	0.0	0.0	0.0	11.7
AZ 19	0.0	0.0	50.6	7.1	0.0	0.0	0.0	0.0	0.0	0.0	14.6	27.6	0.0	0.0	0.0	0.0	24.6
AZ 20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.1	68.9	0.0	0.0	0.0	0.0	2.2
NM-W 5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	5.6
NM-W 7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	7.5
NM-W 11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	4.8
NM-W 13	0.0	71.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.7	0.0	0.0	0.0	0.0	37.6
NM-W 14	0.0	0.0	0.0	60.6	0.0	0.0	0.0	0.0	0.0	0.0	39.4	0.0	0.0	0.0	0.0	0.0	10.2
NM-W 15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.7	0.0	0.0	78.3	0.0	0.0	0.0	0.0	13.9
NM-W 16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	4.4
NM-W 18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	5.9
NM-W 19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	10.0
MT-E 5	0.0	0.0	27.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	66.8	5.5	0.0	0.0	0.0	2.6

Table E-2. Continued.

Harvest area and week	N PAC 1	N N ALTA NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16	Imp
	Major reference area of banding																
MT-E 6	0.0	0.0	21.0	12.7	0.0	0.0	0.0	0.8	0.0	0.0	0.0	63.1	2.5	0.0	0.0	0.0	8.8
MT-E 7	0.0	0.0	7.9	18.8	0.0	0.0	0.0	0.0	0.0	0.0	1.7	71.6	0.0	0.0	0.0	0.0	7.2
MT-E 8	0.0	12.7	8.3	7.4	8.7	1.8	0.0	0.0	0.0	0.0	1.7	55.5	3.3	0.3	0.2	0.0	8.3
MT-E 9	0.0	27.2	37.4	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.9	1.8	0.4	0.0	0.0	9.0
MT-E 10	0.0	28.0	36.7	9.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.8	0.0	0.0	0.0	0.0	9.6
MT-E 11	0.0	11.9	51.5	0.0	0.0	2.9	9.5	0.0	0.0	0.0	2.8	21.3	0.0	0.0	0.0	0.0	9.1
MT-E 12	0.0	38.7	31.6	19.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.6	3.4	0.0	0.0	0.0	4.1
MT-E 13	0.0	40.6	19.3	21.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.0	7.9	0.0	0.0	0.0	6.5
MT-E 14	0.0	0.0	42.1	36.2	0.0	0.0	0.0	0.0	0.0	0.0	12.3	7.4	0.0	2.0	0.0	0.0	3.2
MT-E 15	0.0	28.2	11.0	29.4	10.9	0.0	0.0	0.0	0.0	0.0	2.3	18.2	0.0	0.0	0.0	0.0	6.2
MT-E 16	0.0	14.6	58.1	19.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0	0.0	0.7	0.0	0.0	7.7
MT-E 17	0.0	26.1	39.2	16.3	6.5	0.0	0.0	0.0	0.0	0.0	3.4	8.5	0.0	0.0	0.0	0.0	11.0
MT-E 18	0.0	25.5	32.2	22.9	0.0	0.0	0.0	0.0	0.0	0.0	8.4	10.9	0.0	0.0	0.0	0.0	5.2
ND-W 5	0.0	0.0	5.1	25.1	19.3	7.1	0.0	0.5	0.0	0.0	0.0	10.1	30.0	2.5	0.2	0.0	9.2
ND-W 6	0.0	18.8	0.0	24.7	0.0	5.0	0.0	1.2	0.0	0.0	0.0	7.6	40.8	1.9	0.0	0.0	18.9
ND-W 7	0.0	2.5	3.2	23.5	9.8	3.1	9.5	1.2	0.0	0.0	0.0	5.7	39.9	1.8	0.0	0.0	23.0
ND-W 8	0.0	24.5	0.0	18.3	2.3	6.7	5.3	0.9	0.0	0.0	0.0	3.2	37.2	1.4	0.0	0.0	18.0
ND-W 9	0.0	30.2	0.0	27.0	0.0	6.3	4.6	0.4	0.0	0.0	0.0	0.8	30.5	0.2	0.0	0.0	15.0
ND-W 10	0.0	19.9	0.0	26.7	18.4	3.9	0.0	0.0	0.0	0.0	0.0	2.1	28.2	0.7	0.0	0.0	10.8
ND-W 11	0.0	7.6	0.0	25.7	32.3	13.0	0.0	0.0	0.0	0.0	0.0	0.0	19.3	2.0	0.0	0.0	4.0
ND-E 5	0.0	28.0	0.0	15.6	3.3	5.6	0.0	1.4	0.0	0.0	0.0	2.2	36.9	6.4	0.4	0.1	14.7
ND-E 6	0.0	4.1	2.5	19.9	1.3	5.9	15.0	1.5	0.0	0.0	0.3	3.1	41.0	5.0	0.2	0.0	19.0
ND-E 7	0.0	5.8	2.2	19.7	5.4	12.3	11.1	0.7	0.0	0.0	0.0	2.6	35.8	4.3	0.2	0.1	20.6
ND-E 8	0.0	13.9	3.3	24.7	13.2	8.5	0.0	0.6	0.0	0.0	0.0	2.1	30.8	2.8	0.0	0.0	16.9
ND-E 9	24.9	2.5	1.7	18.7	16.2	6.0	3.6	0.6	0.0	0.0	0.0	2.0	21.1	2.6	0.1	0.0	14.2
ND-E 10	0.0	35.2	0.0	13.5	10.7	11.7	4.4	0.1	0.0	0.0	0.0	1.2	22.2	0.7	0.3	0.0	9.1
ND-E 11	0.0	8.7	0.0	29.6	20.6	6.6	13.1	1.5	0.0	0.0	0.0	0.0	18.5	1.2	0.2	0.0	4.0
SD-W 1	0.0	0.0	0.0	0.0	92.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	0.0	0.0	0.0	0.0	2.7
SD-W 5	0.0	0.0	0.0	50.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.6	30.8	0.0	0.0	0.0	1.4
SD-W 6	0.0	29.9	13.9	18.9	0.0	0.0	0.0	0.0	0.0	0.0	2.8	27.5	7.0	0.0	0.0	0.0	7.8
SD-W 7	0.0	32.6	19.9	12.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.3	6.9	0.0	0.0	0.0	5.5
SD-W 8	0.0	15.1	44.7	30.1	0.0	1.5	0.0	0.0	0.0	0.0	0.0	5.8	2.7	0.0	0.0	0.0	7.3
SD-W 9	0.0	42.5	0.0	22.9	8.3	1.9	12.5	0.0	0.0	0.0	0.0	5.2	6.3	0.3	0.0	0.1	21.8
SD-W 10	0.0	9.9	3.5	23.5	28.7	0.8	30.0	0.0	0.0	0.0	0.0	1.4	2.2	0.0	0.0	0.0	29.2
SD-W 11	0.0	0.0	0.0	65.5	0.0	3.8	0.0	0.0	0.0	0.0	0.0	14.0	16.7	0.0	0.0	0.0	6.0
SD-W 12	0.0	0.0	0.0	81.7	0.0	0.0	0.0	0.0	0.0	0.0	9.8	0.0	8.5	0.0	0.0	0.0	1.8
SD-W 13	0.0	11.7	15.7	17.4	32.2	0.0	0.0	1.0	0.0	0.0	0.0	18.1	3.8	0.0	0.0	0.0	6.3
SD-W 14	0.0	67.3	0.0	21.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.1	0.0	0.0	0.0	3.4
SD-W 16	0.0	91.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.8	0.0	0.0	0.0	0.0	1.6
SD-W 17	0.0	0.0	0.0	19.8	0.0	0.0	0.0	0.0	0.0	0.0	5.9	68.0	6.4	0.0	0.0	0.0	1.8
SD-W 18	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7

Table E-2. Continued.

Harvest area and week	N PAC 1	N N ALTA NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16	Imp
	Major reference area of banding																
SD-E 5	0.0	0.0	6.9	8.8	8.1	2.4	11.0	1.3	0.0	0.0	0.0	4.8	53.1	2.6	0.7	0.3	3.2
SD-E 6	0.0	5.0	5.8	14.3	14.0	3.6	4.2	1.7	0.0	0.0	0.0	4.5	44.2	2.5	0.1	0.0	8.7
SD-E 7	0.0	9.3	0.9	15.7	3.4	4.3	15.9	0.1	0.1	0.0	1.1	3.5	43.0	2.8	0.0	0.0	12.9
SD-E 8	0.0	14.9	0.0	22.1	5.6	5.0	19.2	0.3	0.0	0.0	0.0	3.2	29.1	0.5	0.0	0.1	11.7
SD-E 9	0.0	11.6	3.6	19.2	16.8	1.9	21.1	0.6	0.0	0.0	0.0	2.0	22.1	1.2	0.0	0.0	16.7
SD-E 10	0.0	12.1	4.8	27.1	17.1	3.5	14.3	0.2	0.0	0.0	0.2	3.7	15.9	0.9	0.1	0.0	18.6
SD-E 11	0.0	18.8	2.6	26.0	8.8	4.7	8.2	0.0	0.0	0.0	0.2	5.9	24.0	0.6	0.0	0.0	13.6
SD-E 12	0.0	22.3	7.0	29.7	3.7	8.5	0.0	0.4	0.0	0.0	0.0	3.5	24.3	0.5	0.0	0.1	6.4
SD-E 13	0.0	19.5	0.0	38.3	18.5	2.0	0.0	0.5	0.0	0.0	0.0	3.8	17.4	0.0	0.0	0.0	3.8
SD-E 14	0.0	0.0	0.0	38.4	40.5	2.0	0.0	0.0	0.0	0.0	0.0	0.0	18.6	0.4	0.0	0.0	2.6
SD-E 15	0.0	51.3	0.0	13.6	21.5	0.0	0.0	0.0	0.0	0.0	5.0	6.5	2.2	0.0	0.0	0.0	1.0
WY-E 5	0.0	0.0	29.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44.3	24.8	0.0	1.0	0.0	0.0	1.2
WY-E 6	0.0	0.0	16.4	7.9	0.0	0.0	0.0	0.0	1.7	0.3	50.3	22.8	0.5	0.0	0.0	0.0	6.8
WY-E 7	0.0	0.0	33.5	18.1	0.0	0.0	0.0	0.0	0.6	0.0	30.7	14.1	3.0	0.0	0.0	0.0	4.5
WY-E 8	0.0	0.0	4.9	17.7	0.0	0.0	0.0	0.0	0.0	0.0	45.9	31.5	0.0	0.0	0.0	0.0	3.8
WY-E 9	0.0	21.6	30.1	18.4	0.0	1.4	0.0	0.0	0.0	0.7	14.6	13.3	0.0	0.0	0.0	0.0	6.4
WY-E 10	36.5	8.5	20.3	13.9	0.0	0.0	0.0	0.0	0.7	0.0	13.1	4.5	2.4	0.0	0.0	0.0	11.0
WY-E 11	0.0	18.3	24.3	12.5	0.0	0.0	0.0	0.0	0.4	0.0	35.6	8.8	0.0	0.0	0.0	0.0	6.8
WY-E 12	0.0	11.8	43.6	14.4	0.0	0.0	0.0	0.0	0.0	0.9	18.2	11.1	0.0	0.0	0.0	0.0	5.6
WY-E 13	0.0	13.8	39.2	17.9	4.6	0.0	0.0	0.0	0.4	0.5	17.4	5.9	0.0	0.2	0.0	0.0	7.8
WY-E 14	0.0	24.0	47.5	3.4	0.0	0.0	0.0	0.0	0.2	0.0	20.2	4.7	0.0	0.0	0.0	0.0	9.0
WY-E 15	0.0	15.5	34.9	7.9	0.0	0.0	0.0	0.0	0.6	0.0	31.4	8.5	1.2	0.0	0.0	0.0	5.9
WY-E 16	0.0	11.3	39.0	16.0	0.0	0.0	0.0	0.0	1.0	0.0	23.4	6.9	2.0	0.4	0.0	0.0	7.6
WY-E 17	0.0	0.0	40.1	18.8	7.8	0.0	0.0	0.0	0.2	0.0	22.1	10.4	0.6	0.0	0.0	0.0	8.8
WY-E 18	0.0	27.6	37.2	12.1	0.0	0.0	0.0	0.0	0.6	0.0	15.9	6.6	0.0	0.0	0.0	0.0	10.0
WY-E 19	0.0	26.9	49.7	6.7	7.6	0.0	0.0	0.0	0.0	0.0	5.6	3.5	0.0	0.0	0.0	0.0	4.5
NEBW 6	0.0	0.0	0.0	19.5	9.8	0.0	0.0	0.0	0.0	0.0	2.9	64.4	3.4	0.0	0.0	0.0	1.4
NEBW 7	0.0	39.9	0.0	16.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.1	3.9	0.0	0.0	0.0	3.8
NEBW 8	0.0	0.0	36.2	22.2	5.3	0.0	0.0	0.0	0.0	0.0	5.9	22.7	7.5	0.3	0.0	0.0	3.0
NEBW 9	0.0	36.5	27.5	18.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	14.5	2.4	0.0	0.0	0.0	5.8
NEBW 10	0.0	8.4	27.3	26.6	14.3	0.9	0.0	0.0	0.0	0.0	2.2	20.3	0.0	0.0	0.0	0.0	7.3
NEBW 11	0.0	31.5	16.8	13.3	15.3	0.0	0.0	0.0	0.0	0.0	1.4	21.1	0.6	0.0	0.0	0.0	9.6
NEBW 12	0.0	17.9	20.0	31.8	12.3	2.1	0.0	0.1	0.0	0.0	0.6	12.0	3.0	0.0	0.0	0.0	13.6
NEBW 13	0.0	21.9	25.0	28.5	5.1	0.0	0.0	0.0	0.0	0.0	3.2	12.4	4.0	0.0	0.0	0.0	12.3
NEBW 14	0.0	7.5	22.9	34.4	8.4	0.6	0.0	0.0	0.0	0.0	0.8	20.6	4.7	0.0	0.0	0.0	11.1
NEBW 15	0.0	23.3	24.2	30.0	6.7	0.0	0.0	0.0	0.0	0.0	1.4	12.6	1.8	0.0	0.0	0.0	8.8
NEBW 16	0.0	25.8	36.1	16.7	8.2	1.0	0.0	0.0	0.0	0.0	1.7	6.6	3.8	0.0	0.0	0.0	7.2
NEBW 17	0.0	26.9	48.0	13.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.7	3.1	0.0	0.0	0.0	5.9
NEBW 18	0.0	8.8	35.1	26.5	14.3	0.0	0.0	0.0	0.0	0.0	1.4	11.0	2.9	0.0	0.0	0.0	6.9
NEBW 19	0.0	0.0	31.7	33.3	24.0	0.0	0.0	0.0	0.0	0.0	0.0	11.0	0.0	0.0	0.0	0.0	2.6

Table E-2. Continued.

Harvest area and week	N PAC 1	N ALTA N NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16	Imp
	Major reference area of banding																
NEBE 6	0.0	0.0	22.6	16.4	31.0	2.8	0.0	0.0	0.0	0.0	2.5	15.0	9.8	0.0	0.0	0.0	1.7
NEBE 7	0.0	0.0	0.0	13.0	40.2	2.4	0.0	0.0	0.0	0.0	0.0	12.7	30.5	0.7	0.4	0.0	1.9
NEBE 8	0.0	18.3	14.4	17.1	20.3	3.1	0.0	0.0	0.0	0.0	0.0	11.2	15.6	0.0	0.0	0.0	4.6
NEBE 9	0.0	17.0	4.3	40.1	20.4	3.7	0.0	0.0	0.0	0.0	0.0	4.8	8.8	1.0	0.0	0.0	9.1
NEBE 10	0.0	21.4	6.9	24.9	16.3	4.5	9.5	0.2	0.0	0.0	0.1	7.9	7.7	0.5	0.0	0.0	13.8
NEBE 11	0.0	19.8	12.9	32.5	5.3	4.0	11.2	0.2	0.0	0.0	0.0	3.9	9.8	0.4	0.0	0.0	14.7
NEBE 12	0.0	20.6	6.1	29.7	17.8	3.1	11.6	0.1	0.0	0.0	0.0	3.8	7.2	0.2	0.0	0.0	16.3
NEBE 13	15.8	12.0	4.2	28.6	19.4	3.2	4.2	0.1	0.1	0.0	0.5	4.5	7.0	0.5	0.0	0.0	16.6
NEBE 14	0.0	12.7	15.7	36.4	13.2	2.6	1.8	0.0	0.0	0.0	0.0	6.1	10.9	0.5	0.0	0.0	11.9
NEBE 15	0.0	20.0	12.9	24.4	14.5	1.4	16.1	0.0	0.0	0.0	0.0	6.6	4.2	0.0	0.0	0.0	6.6
NEBE 16	0.0	17.6	0.0	26.1	35.5	2.1	0.0	0.0	0.0	0.0	0.0	6.3	11.7	0.6	0.0	0.0	2.2
CO-E 5	0.0	0.6	0.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	98.2	0.0	0.0	0.0	0.0	31.4
CO-E 6	0.0	0.0	1.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	98.1	0.1	0.0	0.0	0.0	11.4
CO-E 7	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	96.6	0.8	0.0	0.0	0.0	4.7
CO-E 8	0.0	4.6	2.1	2.9	4.7	0.0	0.0	0.0	0.0	0.0	1.9	82.9	0.9	0.0	0.0	0.0	1.6
CO-E 9	0.0	10.7	3.6	14.1	3.4	0.0	0.0	0.0	0.0	0.0	1.6	66.6	0.0	0.0	0.0	0.0	4.0
CO-E 10	0.0	3.1	7.6	6.0	0.8	0.3	0.0	0.0	0.0	0.0	0.3	81.1	0.8	0.0	0.0	0.0	4.7
CO-E 11	0.0	8.4	4.1	10.5	0.9	0.0	0.0	0.0	0.0	0.0	0.5	75.2	0.4	0.1	0.0	0.0	6.8
CO-E 12	0.0	12.9	8.4	10.9	0.0	0.4	2.6	0.0	0.0	0.0	0.5	64.1	0.3	0.0	0.0	0.0	5.8
CO-E 13	0.0	5.5	14.8	2.5	1.5	0.5	0.0	0.0	0.0	0.0	0.7	74.1	0.4	0.0	0.0	0.0	4.5
CO-E 14	0.0	9.4	16.4	13.4	2.5	0.0	0.0	0.0	0.0	0.0	0.0	57.4	1.0	0.0	0.0	0.0	3.1
CO-E 15	0.0	8.4	3.6	9.8	5.3	0.0	0.0	0.0	0.0	0.0	2.2	69.4	1.3	0.0	0.0	0.0	3.8
CO-E 16	0.0	9.0	14.3	14.5	0.0	0.2	2.9	0.0	0.0	0.0	1.3	56.4	1.5	0.0	0.0	0.0	5.2
CO-E 17	0.0	14.0	10.8	11.5	4.2	0.6	0.0	0.0	0.0	0.0	0.3	57.8	0.7	0.0	0.0	0.0	4.5
CO-E 18	0.0	11.3	2.3	18.0	4.7	0.5	0.0	0.0	0.0	0.0	1.9	60.5	0.8	0.0	0.0	0.0	3.3
CO-E 19	0.0	19.1	11.0	19.7	0.0	0.0	0.0	0.0	0.0	0.0	0.5	48.7	0.9	0.0	0.0	0.0	3.0
CO-E 20	0.0	10.9	34.0	5.3	8.9	0.0	0.0	0.0	0.0	0.0	0.4	39.6	0.8	0.0	0.0	0.0	1.7
KS-W 7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	1.1
KS-W 8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	82.5	17.5	0.0	0.0	0.0	2.4
KS-W 9	0.0	29.6	0.0	13.7	37.9	8.2	0.0	0.5	0.0	0.0	0.0	8.8	1.2	0.0	0.0	0.0	23.7
KS-W 10	0.0	0.0	43.4	14.1	0.0	2.8	0.0	0.0	0.0	0.0	4.4	27.1	8.0	0.0	0.0	0.0	9.7
KS-W 11	0.0	42.6	26.8	6.8	23.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.7
KS-W 12	0.0	0.0	24.2	57.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.1	2.9	0.0	0.0	0.0	7.3
KS-W 13	0.0	0.0	0.0	80.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.6	0.0	0.0	0.0	0.0	6.0
KS-W 14	0.0	0.0	25.7	17.2	57.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8
KS-W 15	0.0	46.7	0.0	43.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.4	0.0	0.0	0.0	0.0	17.6
KS-W 16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	59.7	40.3	0.0	0.0	0.0	1.0
KS-W 17	0.0	52.2	0.0	25.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.9	7.5	0.0	0.0	0.0	5.2
KS-W 18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.2	65.8	0.0	0.0	0.0	1.7
KS-W 19	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0
KS-E 5	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0

Table E-2. Continued.

Harvest area and week	Major reference area of banding: N PAC 1	N N ALTA NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16	Imp
KS-E 7	0.0	0.0	0.0	76.8	8.0	4.5	0.0	0.0	0.0	0.0	0.0	8.2	2.5	0.0	0.0	0.0	1.3
KS-E 8	0.0	0.0	6.1	47.9	36.0	3.5	0.0	0.0	0.0	0.0	0.0	2.6	3.9	0.0	0.0	0.0	3.1
KS-E 9	0.0	22.1	13.4	29.8	16.2	2.7	0.0	0.0	0.0	0.0	0.6	6.4	8.8	0.0	0.0	0.0	11.0
KS-E 10	0.0	20.2	11.6	27.0	26.0	3.6	2.7	0.0	0.0	0.0	0.0	4.4	4.3	0.2	0.0	0.0	13.5
KS-E 11	0.0	10.7	11.7	29.6	18.8	3.7	9.1	0.3	0.1	0.0	0.2	6.1	9.5	0.2	0.0	0.0	12.1
KS-E 12	0.0	18.4	14.1	34.9	17.8	2.0	0.0	0.2	0.0	0.0	0.2	5.6	6.4	0.4	0.0	0.0	12.5
KS-E 13	0.0	28.1	11.7	36.0	6.8	4.7	3.2	0.1	0.0	0.0	0.3	4.5	4.4	0.0	0.0	0.0	10.8
KS-E 14	0.0	17.5	16.0	33.3	15.2	4.8	5.1	0.0	0.0	0.0	0.0	2.8	5.3	0.0	0.0	0.0	8.5
KS-E 15	0.0	9.6	11.6	29.4	28.6	0.0	5.9	0.0	0.0	0.0	0.0	7.6	7.1	0.2	0.0	0.0	6.0
KS-E 16	0.0	18.2	5.2	44.9	14.2	6.3	0.0	0.1	0.0	0.0	0.0	3.1	7.5	0.5	0.0	0.0	5.7
KS-E 17	0.0	19.2	17.6	24.4	22.5	4.5	2.5	0.0	0.0	0.0	0.0	3.7	5.5	0.1	0.0	0.0	11.3
KS-E 18	0.0	42.5	13.3	32.7	0.0	4.0	0.0	0.0	0.0	0.0	0.0	4.0	3.6	0.0	0.0	0.0	2.9
NM-E 8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	95.1	0.0	0.0	0.0	0.0	1.9
NM-E 9	0.0	0.0	0.0	0.0	0.0	0.0	48.2	0.0	0.0	0.0	1.2	50.6	0.0	0.0	0.0	0.0	7.4
NM-E 10	0.0	0.0	0.0	21.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	78.1	0.0	0.0	0.0	0.0	3.1
NM-E 11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	95.0	0.0	0.0	0.0	0.0	4.2
NM-E 12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	97.0	0.0	0.0	0.0	0.0	6.1
NM-E 13	0.0	0.0	18.2	5.5	0.0	0.0	0.0	0.0	0.0	0.0	1.8	72.8	1.6	0.0	0.0	0.0	10.6
NM-E 14	0.0	17.1	15.7	8.3	0.0	0.0	0.0	0.0	0.0	0.0	1.6	57.2	0.0	0.0	0.0	0.0	12.3
NM-E 15	0.0	0.0	21.9	14.9	11.3	0.0	0.0	0.0	0.0	0.0	1.9	50.0	0.0	0.0	0.0	0.0	9.4
NM-E 16	0.0	0.0	18.1	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	72.6	3.3	0.0	0.0	0.0	10.3
NM-E 17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	93.0	1.0	0.0	0.0	0.0	8.7
NM-E 18	0.0	0.0	23.2	6.4	0.0	0.0	0.0	0.0	0.0	0.0	1.0	69.4	0.0	0.0	0.0	0.0	10.4
NM-E 19	0.0	0.0	0.0	8.6	0.0	0.0	0.0	0.0	0.0	0.0	4.6	86.8	0.0	0.0	0.0	0.0	6.9
NM-E 20	0.0	0.0	0.0	31.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	64.7	0.0	0.0	0.0	0.0	7.0
NM-E 21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	1.4
OK-W 5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	3.3
OK-W 6	0.0	0.0	60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	38.6	0.0	0.0	0.0	0.0	12.5
OK-W 7	0.0	0.0	0.0	0.0	43.7	0.0	0.0	0.0	0.0	0.0	18.7	37.5	0.0	0.0	0.0	0.0	2.1
OK-W 8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	88.1	11.9	0.0	0.0	0.0	3.4
OK-W 9	0.0	0.0	0.0	38.3	0.0	0.0	0.0	0.0	0.0	0.0	25.0	36.8	0.0	0.0	0.0	0.0	5.2
OK-W 10	0.0	21.2	0.0	10.5	8.3	2.1	0.0	0.0	0.0	0.0	4.6	53.3	0.0	0.0	0.0	0.0	10.6
OK-W 11	0.0	0.0	38.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	58.3	3.7	0.0	0.0	0.0	10.3
OK-W 12	0.0	44.3	0.0	12.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39.7	1.5	1.9	0.0	0.0	9.5
OK-W 13	0.0	0.0	59.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.6	9.4	0.0	0.0	0.0	3.6
OK-W 14	0.0	0.0	0.0	40.7	0.0	0.0	0.0	0.0	0.0	0.0	6.5	52.8	0.0	0.0	0.0	0.0	6.0
OK-W 15	0.0	0.0	41.1	12.8	0.0	0.0	0.0	0.0	0.0	0.0	20.0	26.1	0.0	0.0	0.0	0.0	4.6
OK-W 16	0.0	0.0	0.0	0.0	46.0	8.7	0.0	0.0	0.0	0.0	6.7	38.6	0.0	0.0	0.0	0.0	8.7
OK-W 17	0.0	0.0	0.0	7.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	92.5	0.0	0.0	0.0	0.0	8.2
OK-W 18	0.0	29.7	30.0	13.5	0.0	0.0	0.0	0.0	0.0	0.0	11.9	12.6	2.3	0.0	0.0	0.0	8.8
OK-W 19	0.0	76.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.4	0.0	0.0	0.0	0.0	2.4

Table E-2. Continued.

Harvest area and week	N PAC 1	N ALTA N NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16	Imp
	Major reference area of banding																
OK-E 8	0.0	0.0	12.9	51.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0	3.8	28.4	0.9	0.0	0.1	2.3
OK-E 9	0.0	16.6	0.0	44.4	21.0	2.3	0.0	0.0	0.0	0.0	1.0	8.1	6.3	0.3	0.0	0.0	5.4
OK-E 10	0.0	9.2	4.6	40.7	14.1	1.4	7.7	0.0	0.0	0.0	0.0	7.0	15.2	0.2	0.0	0.0	6.4
OK-E 11	0.0	14.7	9.2	28.4	32.2	4.2	0.0	0.0	0.0	0.0	1.1	4.1	5.5	0.4	0.1	0.0	10.8
OK-E 12	0.0	13.7	15.0	35.7	11.1	3.9	7.4	0.0	0.0	0.0	0.0	5.1	8.0	0.0	0.0	0.0	6.0
OK-E 13	0.0	23.3	3.0	29.2	25.5	1.8	5.5	0.0	0.0	0.0	0.7	2.4	7.8	0.8	0.0	0.0	8.2
OK-E 14	0.0	33.6	6.5	31.2	6.8	5.5	0.0	0.0	0.0	0.0	0.0	3.5	12.9	0.0	0.0	0.0	4.6
OK-E 15	0.0	6.1	20.3	40.8	8.0	3.5	5.4	0.0	0.0	0.0	0.2	4.4	10.5	0.6	0.0	0.0	11.3
OK-E 16	0.0	20.6	5.5	34.9	22.7	3.2	0.0	0.0	0.0	0.0	0.0	4.2	8.4	0.5	0.0	0.0	11.2
OK-E 17	0.0	14.9	18.0	36.0	11.7	3.9	1.7	0.0	0.0	0.0	0.0	5.3	8.4	0.1	0.0	0.0	16.7
OK-E 18	0.0	3.3	12.1	42.1	15.6	7.3	0.0	0.0	0.0	0.0	1.0	3.0	15.3	0.2	0.0	0.0	9.3
OK-E 19	0.0	5.7	8.3	59.7	0.0	0.6	8.2	0.7	0.0	0.0	0.0	5.4	10.7	0.8	0.0	0.0	5.2
OK-E 20	0.0	0.0	29.7	60.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	4.1	1.6	0.0	0.0	1.8
TX-W 7	0.0	88.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.3	0.0	0.0	0.0	0.0	2.9
TX-W 9	0.0	0.0	0.0	39.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	61.0	0.0	0.0	0.0	0.0	2.1
TX-W 10	0.0	23.4	35.3	0.0	19.8	0.0	0.0	0.0	0.0	0.0	0.0	21.5	0.0	0.0	0.0	0.0	6.9
TX-W 11	0.0	0.0	18.3	49.7	0.0	4.5	0.0	0.0	0.0	0.0	0.0	27.5	0.0	0.0	0.0	0.0	6.7
TX-W 12	0.0	0.0	0.0	40.1	0.0	4.7	0.0	0.0	0.0	0.0	0.0	49.0	6.2	0.0	0.0	0.0	6.0
TX-W 13	0.0	0.0	50.5	9.2	0.0	3.8	0.0	0.0	0.0	0.0	3.7	32.9	0.0	0.0	0.0	0.0	7.2
TX-W 14	0.0	0.0	35.8	17.3	12.4	0.0	0.0	0.0	0.0	0.0	0.0	34.5	0.0	0.0	0.0	0.0	10.0
TX-W 15	0.0	20.4	11.8	23.0	0.0	2.4	0.0	0.0	0.0	0.0	2.0	40.3	0.0	0.0	0.0	0.0	12.1
TX-W 16	0.0	26.9	22.5	17.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.9	4.3	0.0	0.0	0.0	9.6
TX-W 17	0.0	21.9	8.8	26.3	0.0	0.0	0.0	0.0	0.0	0.0	4.2	33.3	5.5	0.0	0.0	0.0	10.9
TX-W 18	0.0	0.0	0.0	38.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	49.7	9.1	0.0	0.0	0.0	8.0
TX-W 19	0.0	0.0	27.0	23.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.5	3.4	0.0	0.0	0.0	7.6
TX-W 20	0.0	19.3	30.9	20.1	0.0	2.9	0.0	0.0	0.0	0.0	0.0	26.7	0.0	0.0	0.0	0.0	8.3
TX-W 21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	81.5	18.5	0.0	0.0	0.0	1.4
TX-E 10	0.0	33.8	9.7	31.2	0.0	3.2	0.0	0.0	0.0	0.0	0.0	6.9	14.4	0.9	0.0	0.0	1.7
TX-E 11	0.0	14.7	0.0	38.6	11.7	0.0	25.9	0.0	0.0	0.0	0.0	4.6	4.5	0.0	0.0	0.0	4.5
TX-E 12	0.0	7.0	8.9	40.3	22.2	2.4	0.0	0.2	0.0	0.0	0.5	11.0	7.0	0.6	0.0	0.0	6.3
TX-E 13	0.0	13.0	14.7	42.5	15.2	3.1	0.0	0.1	0.0	0.0	0.4	4.8	5.8	0.3	0.0	0.0	8.3
TX-E 14	0.0	7.5	14.0	27.9	18.1	3.6	14.5	0.0	0.0	0.0	0.4	4.9	8.8	0.3	0.0	0.0	6.1
TX-E 15	0.0	8.2	16.7	39.5	4.9	3.6	8.1	0.0	0.0	0.0	0.3	4.0	13.7	0.8	0.0	0.0	10.1
TX-E 16	14.7	11.6	6.6	30.8	9.7	3.5	9.9	0.0	0.0	0.0	0.4	4.7	8.0	0.1	0.0	0.0	14.5
TX-E 17	0.0	9.9	5.3	39.0	19.3	2.6	11.0	0.0	0.0	0.0	0.5	5.0	6.9	0.4	0.0	0.0	14.6
TX-E 18	0.0	19.6	9.1	32.9	14.8	2.8	4.2	0.0	0.0	0.0	0.6	6.2	9.6	0.3	0.0	0.0	14.7
TX-E 19	0.0	18.7	8.2	33.3	12.4	1.7	11.6	0.0	0.0	0.0	0.0	6.5	7.4	0.2	0.0	0.0	11.4
TX-E 20	0.0	23.1	5.8	30.1	6.4	2.6	21.4	0.0	0.0	0.0	0.0	1.9	8.0	0.7	0.0	0.0	5.7
TX-E 21	0.0	10.9	0.0	39.3	35.4	6.7	0.0	1.2	0.0	0.0	0.0	5.8	0.0	0.7	0.0	0.0	1.4
MN 5	0.0	2.5	0.0	3.8	1.9	2.8	13.2	1.6	0.0	0.0	0.1	0.2	61.5	11.9	0.3	0.1	20.6
MN 6	0.0	3.8	0.0	6.8	3.4	2.4	21.3	0.7	0.0	0.0	0.1	0.6	52.9	7.9	0.2	0.0	25.7

Table E-2. Continued.

Harvest area and week		Major reference area of banding: N PAC 1	N N ALTA NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16	Imp
MN	7	0.0	2.8	0.5	8.6	10.2	3.7	12.3	0.6	0.0	0.0	0.0	0.4	51.8	9.0	0.1	0.0	16.3
MN	8	0.0	6.0	0.0	7.6	8.2	5.4	18.3	0.6	0.0	0.0	0.0	0.7	45.4	7.5	0.2	0.0	13.6
MN	9	0.0	1.3	0.0	7.5	4.2	6.6	33.3	0.9	0.0	0.0	0.3	0.4	38.7	6.5	0.2	0.0	10.0
MN	10	0.0	10.2	0.0	6.6	10.0	7.8	26.4	1.1	0.0	0.0	0.0	0.6	31.3	5.7	0.2	0.1	7.6
MN	11	0.0	3.0	0.0	12.9	5.7	12.2	23.6	0.6	0.0	0.0	0.3	0.0	33.9	7.7	0.1	0.0	3.7
MN	12	0.0	0.0	0.0	24.2	0.0	2.5	45.3	0.0	0.0	0.0	0.0	0.0	24.1	3.9	0.0	0.0	1.5
WISC	5	0.0	0.0	0.0	0.7	0.0	2.4	2.1	2.3	0.0	0.0	0.0	0.0	7.0	85.1	0.4	0.0	13.2
WISC	6	0.0	0.0	0.0	2.0	5.0	2.4	20.8	1.3	0.0	0.0	0.0	0.2	10.4	57.5	0.3	0.1	23.3
WISC	7	0.0	4.2	0.0	3.1	3.8	4.0	18.8	1.4	0.0	0.0	0.0	0.0	11.8	52.5	0.5	0.1	20.8
WISC	8	0.0	2.2	1.0	3.4	6.7	2.4	14.0	2.0	0.0	0.0	0.2	0.3	14.4	53.1	0.3	0.1	14.3
WISC	9	0.0	3.5	0.0	4.5	2.5	4.8	12.2	1.5	0.0	0.0	0.0	0.5	15.1	55.0	0.3	0.1	9.5
WISC	10	0.0	3.0	0.0	2.6	5.2	5.2	34.8	0.5	0.0	0.0	0.0	0.0	11.3	37.2	0.1	0.0	9.8
WISC	11	0.0	4.7	0.0	5.0	2.1	5.1	30.3	2.2	0.0	0.0	0.0	0.6	12.0	38.0	0.1	0.0	6.0
WISC	12	0.0	0.0	0.0	3.6	0.0	4.6	47.2	1.3	0.0	0.0	0.0	1.6	12.1	29.6	0.0	0.1	2.3
MICH	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.7	0.0	0.0	0.0	0.0	8.4	71.5	0.3	0.0	1.3
MICH	6	0.0	0.0	0.0	1.3	6.0	1.4	12.0	11.2	0.0	0.0	0.0	0.0	7.1	59.6	1.1	0.3	26.9
MICH	7	0.0	0.0	2.1	1.0	3.5	1.0	28.6	10.6	0.0	0.0	0.0	0.0	5.1	46.9	0.9	0.3	20.0
MICH	8	0.0	0.0	0.0	3.2	0.0	1.7	14.7	13.7	0.0	0.0	0.0	0.0	10.8	54.7	1.0	0.1	12.5
MICH	9	0.0	3.0	0.0	0.0	7.2	1.5	21.7	12.2	0.0	0.0	0.0	0.0	6.9	46.7	0.8	0.1	9.8
MICH	10	0.0	7.3	0.0	6.8	0.0	5.7	33.7	11.1	0.0	0.0	0.0	0.0	2.2	32.5	0.5	0.2	11.7
MICH	11	0.0	0.0	0.0	4.0	0.0	1.5	47.7	9.7	0.0	0.0	0.0	0.0	5.9	30.9	0.3	0.1	11.5
MICH	12	0.0	0.0	0.0	0.0	5.1	0.9	44.5	11.5	0.0	0.0	0.0	0.0	4.5	33.2	0.3	0.0	5.1
IOWA	5	0.0	6.7	0.0	2.2	4.9	0.8	14.6	0.0	0.0	0.0	0.0	0.0	61.6	9.0	0.1	0.1	4.0
IOWA	6	0.0	9.3	0.0	14.2	0.0	2.8	0.0	1.0	0.0	0.0	0.0	1.3	59.2	11.3	0.6	0.3	2.9
IOWA	7	0.0	12.4	6.6	27.6	3.1	2.8	0.0	2.6	0.0	0.0	1.4	2.4	33.7	7.3	0.1	0.1	2.2
IOWA	8	0.0	8.3	5.0	12.6	12.3	2.8	28.0	0.5	0.0	0.0	0.2	1.8	22.2	6.2	0.1	0.1	12.0
IOWA	9	0.0	15.4	0.7	16.5	9.5	4.9	29.6	0.6	0.0	0.0	0.0	0.8	17.8	4.1	0.0	0.0	17.9
IOWA	10	0.0	15.3	6.1	17.8	18.3	5.7	14.1	0.6	0.0	0.0	0.0	1.3	17.8	2.9	0.1	0.0	17.1
IOWA	11	3.7	11.9	2.2	26.0	10.2	5.8	21.9	0.4	0.0	0.0	0.0	0.5	14.8	2.4	0.0	0.0	21.7
IOWA	12	0.0	9.9	1.0	23.4	14.9	6.6	23.1	0.2	0.0	0.0	0.0	0.7	16.3	3.9	0.0	0.0	12.8
IOWA	13	0.0	9.4	4.9	26.5	7.6	6.3	26.8	0.2	0.0	0.0	0.0	0.6	15.4	2.3	0.0	0.0	7.4
IOWA	14	0.0	0.0	0.0	36.4	49.1	1.6	0.0	0.0	0.0	0.0	0.0	0.0	10.3	2.7	0.0	0.0	1.0
ILL	7	0.0	40.4	0.0	0.0	12.8	7.4	18.9	0.8	0.0	0.0	0.0	0.0	8.9	10.6	0.2	0.0	1.7
ILL	8	0.0	7.7	0.0	19.4	13.9	3.6	31.8	2.5	0.0	0.0	0.0	0.0	12.4	8.2	0.3	0.1	6.3
ILL	9	0.0	7.4	1.3	15.0	7.0	5.7	35.2	1.1	0.1	0.0	0.0	0.7	16.7	9.6	0.2	0.1	13.2
ILL	10	0.0	13.1	0.0	15.2	17.7	7.5	19.9	0.8	0.0	0.0	0.0	0.7	16.0	8.9	0.2	0.0	16.5
ILL	11	11.6	8.5	0.0	20.8	8.3	9.7	10.4	1.4	0.0	0.0	0.0	0.6	19.8	8.7	0.2	0.0	15.8
ILL	12	0.0	6.6	1.0	16.5	11.8	8.2	30.3	1.1	0.0	0.0	0.0	0.8	15.7	7.8	0.2	0.0	15.5
ILL	13	0.0	15.4	0.7	24.9	10.4	8.1	12.9	1.1	0.0	0.0	0.0	0.9	16.9	8.6	0.2	0.0	15.0
ILL	14	0.0	9.8	1.1	16.5	8.6	7.4	32.1	0.7	0.0	0.0	0.0	0.7	15.4	7.6	0.1	0.0	11.7
ILL	15	0.0	8.4	0.0	9.6	9.7	20.4	24.9	0.8	0.0	0.0	0.0	0.0	18.7	7.4	0.1	0.1	2.4

Table E-2. Continued.

Harvest area and week		N PAC 1	N ALTA N NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16	Imp
		Major reference area of banding																
IND	9	0.0	0.0	0.0	25.2	5.1	5.8	16.2	3.3	0.0	0.0	0.0	0.0	11.5	31.5	1.2	0.2	8.6
IND	10	0.0	7.0	0.0	2.1	8.6	3.5	44.9	4.5	0.0	0.0	0.0	0.0	12.8	16.2	0.4	0.0	24.3
IND	11	0.0	18.0	0.0	19.8	4.7	1.9	0.0	4.7	0.0	0.0	0.0	0.0	18.4	31.9	0.5	0.1	9.5
IND	12	0.0	0.0	0.0	8.3	28.9	9.3	10.8	6.9	0.0	0.0	0.0	2.7	15.7	16.4	1.0	0.0	7.5
IND	13	0.0	0.0	0.0	5.5	13.8	3.2	48.3	2.9	0.0	0.0	0.0	0.0	12.6	13.3	0.5	0.0	15.5
IND	14	0.0	0.0	39.2	0.0	0.0	14.9	0.0	3.3	0.0	0.0	0.0	0.0	25.9	16.7	0.0	0.0	4.2
IND	15	0.0	0.0	0.0	0.0	0.0	9.2	0.0	11.9	0.0	0.0	0.0	0.0	42.5	34.2	2.2	0.0	2.0
IND	16	0.0	0.0	0.0	0.0	0.0	14.3	0.0	18.6	0.0	0.0	0.0	0.0	12.1	52.7	0.7	1.6	2.1
IND	17	0.0	0.0	0.0	2.4	4.0	2.7	55.0	3.8	0.0	0.0	0.0	0.0	9.0	22.6	0.4	0.0	19.7
IND	18	0.0	18.9	0.0	12.7	0.0	8.0	0.0	10.7	0.0	0.0	0.0	0.0	21.0	24.7	3.7	0.3	4.7
IND	19	0.0	0.0	0.0	0.0	67.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.5	16.4	0.0	0.0	1.1
OHIO	7	0.0	0.0	0.0	0.0	0.0	1.7	0.0	22.4	0.0	0.0	0.0	0.0	8.8	44.3	22.9	0.0	6.2
OHIO	8	0.0	0.0	0.0	0.0	0.0	1.3	12.0	16.1	0.0	0.0	0.0	0.0	3.8	46.5	20.1	0.2	15.6
OHIO	9	0.0	0.0	0.0	0.0	0.0	2.4	0.0	15.8	0.0	0.0	0.0	0.0	13.2	57.4	10.1	1.1	8.7
OHIO	10	0.0	16.8	0.0	6.0	0.0	1.6	10.6	13.9	0.0	0.0	0.0	0.0	6.3	33.8	11.0	0.1	11.2
OHIO	11	0.0	0.0	0.0	10.3	0.0	2.0	0.0	16.2	0.0	0.0	0.0	0.0	11.9	53.8	5.3	0.5	10.8
OHIO	12	0.0	0.0	0.0	0.0	7.4	2.9	18.4	15.9	0.0	0.0	0.0	0.0	7.2	43.0	5.1	0.0	11.7
OHIO	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.8	0.0	0.0	0.0	0.0	10.1	56.5	8.3	1.3	8.4
OHIO	14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.9	0.0	0.0	0.0	0.0	23.8	29.1	9.4	0.8	1.7
OHIO	17	0.0	0.0	0.0	0.0	0.0	4.7	0.0	34.1	0.0	0.0	0.0	0.0	9.1	48.0	3.7	0.4	6.7
OHIO	18	0.0	0.0	0.0	6.2	6.1	1.5	6.5	32.7	0.0	0.0	0.0	0.0	9.2	34.3	3.5	0.1	14.2
OHIO	20	0.0	0.0	0.0	0.0	0.0	0.0	93.5	3.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	0.0	2.5
MO	9	0.0	12.7	6.6	24.6	13.8	8.0	19.7	0.1	0.0	0.0	0.0	2.5	11.2	0.8	0.0	0.0	9.0
MO	10	0.0	13.0	9.2	28.7	17.4	6.8	9.2	0.5	0.0	0.0	0.0	1.9	11.9	1.4	0.0	0.0	16.0
MO	11	5.1	20.2	3.4	23.3	12.2	4.7	17.2	0.2	0.0	0.0	0.2	1.1	11.3	1.2	0.0	0.0	19.6
MO	12	0.0	16.9	3.8	24.4	9.3	6.2	24.8	0.1	0.0	0.0	0.4	1.3	11.0	1.9	0.0	0.0	16.9
MO	13	0.0	13.7	7.1	26.8	9.0	5.7	21.4	0.2	0.0	0.0	0.0	1.7	12.4	1.8	0.0	0.0	15.2
MO	14	0.0	9.1	5.1	26.9	19.2	4.9	19.2	0.1	0.0	0.0	0.0	1.5	12.5	1.4	0.0	0.0	12.2
MO	15	0.0	12.3	0.0	31.0	14.6	7.7	15.0	0.0	0.0	0.0	0.0	0.8	17.1	1.3	0.2	0.0	6.0
MO	16	0.0	26.6	14.7	18.9	19.1	6.2	0.0	0.5	0.0	0.0	0.0	3.6	8.4	2.1	0.0	0.0	3.5
KY	13	0.0	10.5	8.7	20.2	33.6	4.1	0.0	1.9	0.0	0.0	0.0	0.0	16.5	4.2	0.4	0.0	9.8
KY	14	0.0	17.6	0.0	24.3	22.1	2.8	0.0	8.2	0.0	0.0	0.0	1.8	14.5	7.6	0.7	0.2	11.6
KY	15	0.0	0.0	0.0	5.9	7.8	14.3	35.3	8.8	0.0	0.0	0.0	0.0	16.3	10.7	0.5	0.3	10.3
KY	16	0.0	0.0	0.0	20.5	18.5	4.8	12.6	13.5	0.0	0.0	0.0	0.0	9.8	19.2	0.9	0.1	11.5
KY	17	0.0	8.9	0.0	13.6	3.3	4.1	39.2	8.1	0.0	0.0	0.0	0.0	10.8	11.4	0.4	0.1	23.6
KY	18	0.0	11.1	0.0	6.6	0.0	2.6	31.9	10.9	0.0	0.0	0.0	2.6	13.6	18.8	1.8	0.1	15.0
KY	19	0.0	0.0	0.0	0.0	0.0	13.5	28.3	22.9	0.0	0.0	0.0	0.0	11.6	22.1	1.6	0.0	6.2
KY	20	0.0	0.0	14.4	15.0	19.6	7.0	16.6	12.4	0.0	0.0	0.0	0.0	3.7	10.0	1.3	0.0	8.8
KY	21	0.0	0.0	0.0	33.2	0.0	0.0	0.0	16.5	0.0	0.0	0.0	0.0	32.1	18.3	0.0	0.0	1.8

Table E-2. Continued.

Harvest area and week		Major reference area of banding																
		N PAC 1	N N ALTA NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16	Imp
ARK	12	0.0	3.1	3.9	31.6	17.8	6.2	27.0	0.3	0.0	0.0	0.0	0.3	8.3	1.4	0.0	0.0	5.2
ARK	13	0.0	12.9	3.3	33.0	20.5	7.0	6.1	0.4	0.0	0.0	0.1	1.6	13.1	1.8	0.0	0.0	13.7
ARK	14	4.0	16.0	5.6	29.5	13.6	5.2	8.5	0.3	0.0	0.0	0.2	2.3	13.2	1.6	0.0	0.0	14.0
ARK	15	0.0	16.8	9.1	28.6	14.8	6.6	4.6	0.4	0.0	0.0	0.2	2.0	14.8	1.9	0.1	0.0	9.5
ARK	16	0.0	11.3	7.1	29.1	23.1	5.1	5.6	0.5	0.0	0.0	0.1	2.4	13.7	2.0	0.0	0.0	13.8
ARK	17	0.0	8.7	5.9	29.4	15.7	5.6	12.9	0.7	0.0	0.0	0.1	3.2	15.2	2.6	0.0	0.0	15.5
ARK	18	0.0	9.0	3.5	29.2	17.1	7.2	14.4	0.7	0.0	0.0	0.1	2.8	13.8	2.2	0.1	0.0	13.0
ARK	19	0.0	13.8	3.7	33.7	12.0	7.2	12.0	1.0	0.0	0.0	0.1	1.9	11.9	2.6	0.1	0.0	10.2
ARK	20	0.0	8.4	11.4	34.5	12.5	7.1	9.8	1.1	0.0	0.0	0.3	1.2	11.6	2.0	0.1	0.0	4.3
TENN	11	0.0	0.0	0.0	58.9	0.0	22.0	0.0	0.0	0.0	0.0	0.0	0.0	14.2	4.9	0.0	0.0	1.0
TENN	12	0.0	0.0	0.0	49.7	0.0	24.5	0.0	12.8	0.0	0.0	0.0	0.0	8.0	4.9	0.0	0.0	1.2
TENN	13	0.0	0.0	0.0	24.5	0.0	10.2	0.0	7.9	0.0	0.0	0.0	0.0	31.0	23.4	3.0	0.0	2.0
TENN	14	0.0	14.8	0.0	17.7	12.0	6.4	20.3	3.4	0.0	0.0	0.0	1.1	16.0	7.6	0.5	0.1	10.4
TENN	15	0.0	14.6	0.0	22.1	8.4	9.9	15.7	5.6	0.0	0.0	0.0	0.7	10.5	11.4	0.9	0.0	9.0
TENN	16	0.0	2.7	5.5	19.3	4.3	6.5	30.5	6.5	0.0	0.0	0.0	1.5	11.3	11.3	0.5	0.2	16.8
TENN	17	0.0	8.9	0.0	12.5	11.4	7.5	32.2	6.7	0.0	0.0	0.0	0.3	9.6	9.8	1.1	0.1	18.5
TENN	18	0.0	4.4	0.0	21.0	16.6	5.2	20.4	5.9	0.0	0.0	0.0	1.9	13.3	10.8	0.5	0.1	20.3
TENN	19	0.0	10.1	0.0	13.6	11.5	3.6	23.3	8.5	0.0	0.0	0.0	1.4	14.3	12.9	0.6	0.3	10.6
TENN	20	0.0	0.0	0.0	27.4	0.0	4.9	43.0	10.1	0.0	0.0	0.0	0.0	6.8	7.5	0.4	0.0	9.4
LA	10	0.0	21.0	3.1	41.2	15.0	7.9	0.0	0.0	0.0	0.0	0.0	2.7	8.8	0.3	0.0	0.0	2.4
LA	11	0.0	16.0	11.4	35.3	13.9	4.9	8.0	0.1	0.0	0.0	0.2	1.4	7.4	1.5	0.0	0.0	7.8
LA	12	0.0	17.2	4.3	31.5	19.8	5.6	7.4	0.3	0.0	0.0	0.3	2.9	10.0	0.6	0.1	0.0	11.1
LA	13	0.0	14.0	3.7	27.9	25.7	6.2	5.5	0.3	0.0	0.0	0.2	2.3	12.6	1.5	0.0	0.0	9.6
LA	14	0.0	15.7	10.0	29.4	22.1	2.8	1.8	0.2	0.0	0.0	0.0	2.8	13.9	1.2	0.1	0.0	9.7
LA	15	0.0	12.3	1.4	36.3	25.5	4.0	4.7	0.1	0.0	0.0	0.0	1.9	12.1	1.6	0.0	0.0	10.0
LA	16	0.0	15.9	8.3	25.6	21.0	6.3	8.3	0.3	0.0	0.0	0.0	1.8	10.4	2.0	0.0	0.0	14.8
LA	17	0.0	19.3	2.9	32.9	8.4	5.9	14.8	0.8	0.0	0.0	0.0	1.9	11.1	2.0	0.0	0.0	15.1
LA	18	0.0	6.2	6.9	41.2	18.3	6.8	7.4	0.7	0.0	0.0	0.0	2.3	7.6	2.4	0.1	0.0	9.8
LA	19	0.0	11.2	3.5	31.0	9.3	4.4	27.3	0.6	0.0	0.1	0.0	0.8	10.2	1.3	0.1	0.0	7.6
LA	20	0.0	8.1	0.0	28.9	31.7	13.0	4.4	0.8	0.0	0.0	0.0	3.2	8.9	0.9	0.3	0.0	1.6
MISS	12	0.0	30.4	0.0	39.6	0.0	17.1	0.0	2.3	0.0	0.0	0.0	0.0	5.4	4.7	0.5	0.0	1.2
MISS	13	0.0	18.6	7.2	32.6	11.8	7.3	0.0	0.7	0.0	0.0	0.0	0.0	19.5	2.2	0.0	0.1	5.5
MISS	14	0.0	4.3	0.0	34.2	9.1	6.1	28.6	0.9	0.0	0.0	0.0	0.7	13.2	2.8	0.2	0.0	8.8
MISS	15	0.0	6.9	1.5	24.6	5.4	5.4	36.4	1.9	0.0	0.0	0.0	1.4	13.1	3.1	0.0	0.1	10.6
MISS	16	0.0	15.6	3.2	30.5	9.8	9.5	2.5	2.9	0.0	0.0	0.0	1.3	17.8	6.6	0.1	0.0	12.5
MISS	17	0.0	8.2	0.0	27.3	13.6	9.8	18.9	0.9	0.0	0.0	0.3	0.5	14.2	6.0	0.3	0.0	12.6
MISS	18	0.0	10.1	1.1	29.1	13.6	6.5	22.5	2.3	0.1	0.0	0.0	1.5	9.2	3.8	0.1	0.0	16.7
MISS	19	0.0	13.3	6.4	28.7	10.3	6.9	12.7	2.8	0.0	0.0	0.2	1.1	12.0	5.2	0.2	0.0	15.7
MISS	20	0.0	4.0	0.0	31.1	9.1	11.1	22.6	2.7	0.0	0.0	0.0	1.8	12.5	4.7	0.3	0.0	12.3
MISS	21	0.0	32.3	0.0	15.0	32.9	6.4	0.0	2.1	0.0	0.0	0.0	0.0	5.9	5.4	0.0	0.0	2.6
ALAB	13	0.0	43.0	0.0	0.0	25.0	12.5	0.0	0.0	0.0	0.0	0.0	0.0	9.2	7.2	3.2	0.0	4.5
ALAB	14	0.0	19.3	0.0	14.9	14.9	11.5	0.0	13.0	0.0	0.0	0.0	3.6	11.1	9.6	2.1	0.1	7.8
ALAB	15	0.0	0.0	0.0	0.0	0.0	0.0	32.5	5.6	0.0	0.0	0.0	7.2	35.3	18.2	1.1	0.0	5.7

Table E-2. Continued.

Harvest area and week	N PAC 1	N N ALTA NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16	Imp
	Major reference area of banding																
ALAB 16	0.0	10.5	23.2	14.1	0.0	2.5	12.6	10.8	0.0	0.0	0.0	2.2	8.4	14.9	0.7	0.1	22.1
ALAB 17	0.0	0.0	0.0	10.2	17.7	6.5	0.0	18.3	0.0	0.0	0.0	0.0	22.1	23.7	1.5	0.2	13.8
ALAB 18	0.0	0.0	0.0	23.4	16.9	8.6	0.0	14.5	0.0	0.0	0.0	0.0	14.1	21.6	0.8	0.1	16.1
ALAB 19	0.0	0.0	8.0	5.1	4.2	3.8	6.0	24.5	0.0	0.0	0.0	0.0	26.9	20.6	0.5	0.2	13.6
ALAB 20	0.0	0.0	0.0	15.9	12.1	18.4	0.0	17.8	0.0	0.0	0.0	0.0	6.7	28.2	0.8	0.0	9.1
ALAB 21	0.0	0.0	0.0	0.0	8.2	0.0	60.3	11.8	0.0	0.0	0.0	0.0	12.3	7.1	0.2	0.1	7.0
ME 5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	21.4
ME 6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	69.5	19.7
ME 7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.2	31.8
ME 8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	6.0
ME 9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	2.3
ME 11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	3.2
ME 12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	8.2
ME 13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	90.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.7	4.3
ME 14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	1.3
VT 5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6
VT 6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.8	0.0	0.0	0.0	0.0	0.0	4.8	0.0	66.3	41.1
VT 7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.6	0.0	0.0	0.0	0.0	0.0	0.0	2.8	63.5	22.6
VT 8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	60.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39.6	13.1
VT 9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.7	0.0	0.0	0.0	0.0	0.0	10.4	2.6	43.3	8.2
VT 10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	66.6	6.9
VT 11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.8	5.8	77.3	2.8
VT 12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	1.8
VT 13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	95.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	1.6
N H 5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	16.1
N H 6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.4	0.0	0.0	0.0	0.0	0.0	37.0	0.0	51.6	35.6
N H 7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	5.2
N H 8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	56.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.8	31.4
N H 11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	2.1
N H 12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	1.3
N H 13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	8.3
MASS 6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	1.8
MASS 7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	32.3	0.0	0.0	0.0	0.0	0.0	0.0	1.3	66.3	18.0
MASS 8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	56.2	0.0	0.0	0.0	0.0	0.0	0.8	0.0	43.0	22.3
MASS 9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.7	0.0	0.0	0.0	0.0	19.3	0.0	2.2	34.8	10.0
MASS 10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	61.1	5.7
MASS 11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	57.6	4.9
MASS 12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.0	0.0	0.0	0.0	0.0	0.0	0.0	14.6	59.3	4.3
MASS 13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.4	4.5
MASS 14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	58.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41.6	5.3

Table E-2. Continued.

Harvest area and week	N PAC 1	N N ALTA NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16	Imp
	Major reference area of banding																
MASS 15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	2.6
MASS 16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.7	0.0	0.0	0.0	0.0	19.6	2.7	8.9	37.1	10.0
MASS 17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.1	0.0	0.0	0.0	0.0	0.0	0.0	5.0	66.9	7.2
MASS 18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	1.2
MASS 22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	1.1
CT 7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	70.5	0.0	0.0	0.0	0.0	0.0	0.0	1.7	27.8	7.3
CT 8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.9	0.0	0.0	0.0	0.0	0.0	15.3	4.2	31.6	12.1
CT 9	0.0	0.0	0.0	36.3	0.0	0.0	0.0	38.4	0.0	0.0	0.0	0.0	8.9	0.0	2.9	13.5	21.9
CT 10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	87.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.3	2.3
CT 14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	81.0	0.0	0.0	0.0	0.0	16.9	0.0	0.0	2.2	15.6
CT 15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.9	0.0	0.0	0.0	0.0	30.9	25.9	7.3	10.0	8.3
CT 16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	58.3	0.0	0.0	0.0	0.0	0.0	0.0	7.8	33.9	3.9
CT 17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	63.6	0.0	0.0	0.0	0.0	0.0	30.4	0.0	6.0	17.6
CT 18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.4	0.0	0.0	0.0	0.0	0.0	0.0	6.0	57.6	5.6
CT 19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	67.2	0.0	0.0	0.0	0.0	0.0	0.0	28.9	3.9	4.5
R I 8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	89.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.9	16.6
R I 10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	1.0
R I 11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	1.8
R I 12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	92.0	8.0	3.0
R I 13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	9.9
R I 14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	92.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.4	29.5
R I 15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	2.8
R I 16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	80.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	6.0
R I 17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	70.8	0.0	0.0	0.0	0.0	0.0	0.0	16.2	12.9	17.3
R I 18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	2.5
R I 19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	5.1
R I 20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	4.4
N Y 5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	58.4	0.0	0.0	0.0	0.0	0.8	2.8	27.3	10.6	4.9
N Y 6	0.0	0.0	0.0	0.0	0.0	0.3	25.7	38.6	0.0	0.0	0.0	0.0	0.2	3.2	18.9	13.0	18.4
N Y 7	0.0	0.0	0.0	0.0	0.0	0.7	0.0	37.5	0.0	0.0	0.0	0.0	2.6	4.1	37.8	17.4	20.9
N Y 8	0.0	0.0	0.0	0.0	0.0	1.4	9.1	30.0	0.0	0.0	0.0	0.0	1.6	3.8	41.3	12.8	10.4
N Y 9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.1	0.0	0.0	0.0	0.0	1.3	4.9	30.5	13.2	7.6
N Y 10	0.0	0.0	0.0	3.3	0.0	0.0	46.9	15.1	0.0	0.0	0.0	0.0	1.1	3.1	21.7	8.8	9.8
N Y 11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.4	0.0	0.0	0.0	0.0	3.3	1.9	26.4	18.1	5.5
N Y 12	0.0	0.0	0.0	0.0	6.0	0.0	0.0	62.1	0.0	0.0	0.0	0.0	0.0	8.9	13.2	9.8	4.4
N Y 13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.0	0.0	0.0	0.0	0.0	0.0	6.7	21.6	20.6	2.0
N Y 15	0.0	0.0	0.0	0.0	0.0	13.4	0.0	55.1	0.0	0.0	0.0	0.0	0.0	0.0	15.6	15.9	1.1
N Y 16	0.0	0.0	0.0	0.0	0.0	0.0	63.9	23.4	0.0	0.0	0.0	0.0	0.0	3.1	5.9	3.8	7.3
N Y 17	0.0	0.0	0.0	0.0	0.0	3.9	0.0	70.5	0.0	0.0	0.0	0.0	0.0	0.9	13.9	10.8	3.6
N Y 18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.2	0.0	0.0	0.0	0.0	0.0	23.7	10.0	16.1	1.9
PA 6	0.0	0.0	0.0	0.0	0.0	0.8	56.9	21.1	0.0	0.0	0.0	0.0	0.8	6.5	12.6	1.3	26.7
PA 7	0.0	0.0	0.0	0.0	0.0	1.6	0.0	33.8	0.0	0.0	0.0	0.0	4.6	20.8	34.5	4.7	12.6

Table E-2. Continued.

Harvest area and week		Major reference area of banding: N PAC 1	N ALTA N NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16	Imp
PA	8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.5	0.0	0.0	0.0	0.0	5.0	11.4	31.3	3.9	7.7
PA	9	0.0	0.0	0.0	0.0	0.0	4.1	0.0	30.4	0.0	0.0	0.0	0.0	4.4	21.0	36.8	3.4	4.7
PA	10	0.0	0.0	0.0	0.0	0.0	6.2	0.0	50.1	0.0	0.0	0.0	0.0	0.0	14.3	25.6	3.8	9.1
PA	11	0.0	0.0	0.0	0.0	0.0	3.5	23.7	45.1	0.0	0.0	0.0	0.0	5.8	9.5	10.9	1.5	12.9
PA	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	56.8	0.0	0.0	0.0	0.0	5.5	15.1	20.0	2.5	8.9
PA	13	0.0	0.0	0.0	0.0	0.0	0.0	20.0	44.5	0.0	0.0	0.0	0.0	7.4	11.6	13.7	2.7	7.4
PA	14	0.0	0.0	0.0	11.7	0.0	0.0	0.0	45.2	0.0	0.0	0.0	0.0	3.5	10.6	24.9	4.0	4.8
PA	15	0.0	0.0	0.0	16.2	0.0	0.0	0.0	48.7	0.0	0.0	0.0	0.0	7.5	7.9	13.1	6.7	3.9
W V	7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	2.0
W V	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	2.3
W V	14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	63.6	18.4	18.0	0.0	3.3
W V	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.0	0.0	0.0	0.0	0.0	0.0	43.8	3.2	0.0	7.2
W V	16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.4	0.0	0.0	0.0	0.0	7.7	28.9	7.1	0.9	14.0
W V	17	0.0	0.0	30.3	0.0	0.0	0.0	0.0	26.4	0.0	0.0	0.0	0.0	25.8	13.0	0.0	4.5	15.8
W V	18	0.0	0.0	0.0	0.0	0.0	0.0	80.1	8.6	0.0	0.0	0.0	0.0	0.0	8.2	1.1	2.1	43.5
W V	19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.6	0.0	0.0	0.0	0.0	0.0	42.9	28.4	0.0	2.2
W V	20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.1	0.0	0.0	0.0	0.0	0.0	52.9	0.0	0.0	8.8
N J	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	85.8	0.0	0.0	0.0	0.0	0.0	0.0	13.4	0.8	2.2
N J	7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	60.7	0.0	0.0	0.0	0.0	3.8	17.7	9.3	8.6	14.0
N J	8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44.7	0.0	0.0	0.0	0.0	5.9	17.4	16.4	15.6	7.9
N J	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.7	0.0	0.0	0.0	0.0	0.0	14.8	20.8	21.7	3.1
N J	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41.8	0.0	0.0	0.0	0.0	0.0	10.1	20.4	27.7	4.0
N J	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	65.4	0.0	0.0	0.0	0.0	0.0	0.0	10.8	23.8	2.5
N J	12	0.0	0.0	0.0	0.0	0.0	5.4	0.0	67.8	0.0	0.0	0.0	0.0	0.0	10.1	8.5	8.3	9.7
N J	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	60.1	0.0	0.0	0.0	0.0	8.9	10.7	10.1	10.2	12.4
N J	14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	74.1	0.0	0.0	0.0	0.0	4.2	6.1	6.0	9.5	9.8
N J	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35.1	0.0	0.0	0.0	0.0	8.3	20.0	18.1	18.5	5.5
N J	16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	65.6	0.0	0.0	0.0	0.0	0.0	2.7	13.9	17.8	8.2
N J	17	0.0	0.0	0.0	0.0	0.0	6.2	0.0	43.3	0.0	0.0	0.0	0.0	8.8	20.5	12.2	9.0	9.4
N J	18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	64.2	0.0	0.0	0.0	0.0	6.6	7.4	11.1	10.6	7.2
N J	19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	78.6	0.0	0.0	0.0	0.0	18.1	0.0	0.0	3.2	2.1
N J	21	0.0	0.0	0.0	0.0	0.0	48.4	0.0	51.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
DEL	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.6	0.0	0.0	0.0	0.0	22.8	18.9	23.5	10.1	2.0
DEL	10	0.0	0.0	0.0	0.0	0.0	0.0	43.2	34.3	0.0	0.0	0.0	0.0	2.8	6.7	10.7	2.2	18.6
DEL	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	65.4	0.0	0.0	0.0	0.0	6.0	14.6	5.7	8.4	8.9
DEL	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	70.6	0.0	0.0	0.0	0.0	8.4	3.1	10.2	7.6	9.3
DEL	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.3	0.0	0.0	0.0	0.0	0.0	16.9	17.0	17.8	4.7
DEL	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.6	0.0	0.0	0.0	0.0	9.3	18.5	19.0	9.6	6.2
DEL	16	0.0	0.0	0.0	25.7	0.0	0.0	0.0	51.7	0.0	0.0	0.0	0.0	1.7	6.2	9.4	5.2	13.7
DEL	17	0.0	0.0	0.0	9.3	0.0	0.0	0.0	58.5	1.0	0.0	0.0	0.0	0.0	18.1	7.6	5.6	19.9
DEL	18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	83.6	0.0	0.0	0.0	0.0	0.0	5.8	8.7	2.0	9.0

Table E-2. Continued.

Harvest area and week		Major reference area of banding: N PAC 1	N N ALTA NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16	Imp
DEL	19	0.0	0.0	0.0	0.0	50.2	0.0	0.0	20.3	0.0	0.0	0.0	0.0	9.6	14.3	4.6	0.9	6.2
MD	9	0.0	0.0	0.0	0.0	0.0	17.7	0.0	61.6	0.0	0.0	0.0	0.0	0.0	11.2	7.9	1.6	2.2
MD	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	62.8	0.0	0.0	0.0	0.0	0.0	20.1	12.2	5.0	3.0
MD	11	0.0	0.0	0.0	0.0	0.0	5.7	0.0	57.7	0.0	0.0	0.0	0.0	4.7	19.6	5.0	7.4	7.0
MD	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	64.6	0.0	0.0	0.0	0.0	15.3	5.5	10.5	4.1	9.4
MD	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.1	0.0	0.0	0.0	0.0	8.9	17.2	12.4	11.3	7.6
MD	14	0.0	0.0	0.0	0.0	15.7	0.0	43.7	15.9	0.0	0.0	0.0	0.0	0.0	10.9	10.9	2.8	9.6
MD	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.7	0.0	0.0	0.0	0.0	15.8	20.5	19.0	10.0	5.1
MD	16	0.0	0.0	0.0	19.5	0.0	0.0	33.9	23.8	0.0	0.0	0.0	0.0	0.0	8.7	9.6	4.4	12.4
MD	17	0.0	0.0	0.0	0.0	0.0	8.5	0.0	44.9	0.0	0.0	0.0	0.0	8.7	13.8	18.2	5.8	13.0
MD	18	0.0	0.0	0.0	0.0	19.7	0.0	0.0	38.3	0.0	0.0	0.0	0.0	4.5	12.3	15.5	9.7	9.2
MD	19	0.0	0.0	0.0	0.0	0.0	0.0	66.2	21.7	0.0	0.0	0.0	0.0	5.5	1.1	3.6	1.9	17.8
MD	20	0.0	0.0	0.0	0.0	0.0	4.3	0.0	57.3	0.0	0.0	0.0	0.0	10.4	13.5	12.3	2.3	3.6
VA	11	0.0	32.1	0.0	0.0	0.0	0.0	0.0	31.5	0.0	0.0	0.0	0.0	0.0	24.9	7.0	4.5	2.7
VA	12	0.0	0.0	0.0	0.0	0.0	2.2	30.3	41.0	0.0	0.0	0.0	0.0	7.1	11.7	5.0	2.6	5.7
VA	13	0.0	0.0	0.0	6.5	0.0	3.1	52.4	16.8	0.0	0.0	0.0	0.0	7.6	7.8	4.5	1.4	24.0
VA	14	0.0	0.0	0.0	0.0	0.0	4.4	0.0	50.0	0.0	0.0	0.0	0.0	6.9	15.8	18.0	4.8	5.8
VA	15	0.0	0.0	0.0	11.7	0.0	4.5	0.0	28.4	0.0	0.0	0.0	0.0	6.8	27.4	14.2	7.0	5.9
VA	16	0.0	0.0	0.0	0.0	0.0	8.5	0.0	47.2	0.0	0.0	0.0	0.0	6.5	27.4	7.1	3.3	11.9
VA	17	0.0	0.0	0.0	0.0	0.0	13.2	0.0	32.9	0.0	0.0	0.0	0.0	15.0	23.1	11.0	4.8	10.4
VA	18	0.0	11.2	0.0	0.0	8.5	0.0	0.0	40.0	0.8	0.0	0.0	0.0	12.3	12.4	10.6	4.2	11.9
VA	19	0.0	19.9	0.0	13.9	0.0	0.0	0.0	31.8	0.0	0.0	0.0	0.0	10.3	14.4	7.9	1.7	12.2
VA	20	0.0	0.0	0.0	0.0	0.0	4.0	0.0	50.6	0.0	0.0	0.0	0.0	5.3	34.3	4.7	1.1	7.8
VA	21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	58.7	0.0	0.0	0.0	0.0	17.2	20.5	0.0	3.6	1.4
N C	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.5	0.0	0.0	0.0	0.0	28.8	46.6	9.1	0.0	1.1
N C	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.2	0.0	0.0	0.0	0.0	33.0	9.6	4.5	7.6	4.4
N C	13	0.0	0.0	0.0	0.0	0.0	3.7	69.8	13.3	0.0	0.0	0.0	0.0	2.9	6.0	2.7	1.5	12.1
N C	14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.8	0.0	0.0	0.0	0.0	7.1	45.7	10.1	6.2	5.1
N C	15	0.0	0.0	0.0	0.0	0.0	5.9	0.0	48.4	0.0	0.0	0.0	0.0	11.2	19.7	8.3	6.4	6.6
N C	16	0.0	0.0	0.0	0.0	0.0	5.1	18.2	46.2	0.0	0.0	0.0	0.0	4.4	18.5	4.5	3.0	16.4
N C	17	0.0	0.0	0.0	0.0	5.4	3.1	0.0	46.6	0.0	0.0	0.0	0.0	2.7	30.1	8.6	3.5	13.9
N C	18	0.0	0.0	0.0	0.0	0.0	2.6	0.0	46.0	0.0	0.0	0.0	0.0	7.4	36.9	4.4	2.7	15.4
N C	19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.7	0.0	0.0	0.0	0.0	8.7	32.3	8.2	0.1	11.5
N C	20	0.0	0.0	0.0	11.7	0.0	0.0	0.0	63.0	0.0	0.0	0.0	0.0	3.0	17.0	4.7	0.7	10.9
N C	21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.1	0.0	0.0	0.0	0.0	16.1	37.7	2.9	1.1	2.2
S C	12	0.0	0.0	0.0	13.8	0.0	0.0	32.7	18.4	0.0	0.0	0.0	0.0	13.2	16.4	3.5	2.1	4.2
S C	13	0.0	0.0	0.0	0.0	41.6	2.9	0.0	23.0	0.0	0.0	0.0	0.0	14.8	14.6	1.5	1.7	7.0
S C	14	0.0	0.0	0.0	0.0	0.0	1.4	45.9	16.1	0.0	0.0	0.0	1.7	12.4	18.0	3.7	0.9	13.6
S C	15	0.0	0.0	0.0	0.0	13.4	4.2	0.0	26.3	0.0	0.0	0.0	0.0	18.3	28.2	8.1	1.4	6.2
S C	16	0.0	0.0	0.0	0.0	0.0	3.5	5.2	28.1	0.0	0.0	0.0	0.0	12.9	44.3	4.4	1.7	11.8
S C	17	0.0	0.0	0.0	0.0	0.0	2.8	28.2	24.3	0.0	0.0	0.0	0.0	10.8	27.7	4.8	1.5	14.3

Table E-2. Continued.

Harvest area and week		Major reference area of banding																
		N PAC 1	N N ALTA NWT 2	SW ALTA 3	SW SASK 4	SE SASK 5	SW MAN 6	N SASK N MAN W ONT 7	E ONT W QUE 8	WA-OR 9	N Ca 10	Inter mtn 11	High Plains 12	Missouri River Basin 13	Great Lakes 14	Mid-Atl 15	NE United States 16	Imp
S C	18	0.0	0.0	0.0	20.9	4.6	4.5	0.0	25.5	0.0	0.0	0.0	1.4	9.6	27.2	5.4	0.7	17.5
S C	19	0.0	0.0	6.1	9.1	12.1	0.6	0.0	25.0	0.0	0.0	0.0	0.0	13.4	28.1	4.7	1.1	13.9
S C	20	0.0	0.0	0.0	2.8	0.0	5.7	0.0	29.3	0.0	0.0	0.0	1.1	14.0	41.8	4.2	0.9	8.2
S C	21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.5	0.0	0.0	0.0	0.0	12.2	33.7	4.9	0.7	2.9
GA	12	0.0	57.3	0.0	0.0	0.0	0.0	0.0	4.8	0.0	0.0	0.0	16.6	5.0	16.2	0.0	0.0	7.0
GA	13	0.0	36.4	0.0	0.0	0.0	0.0	48.9	1.0	0.0	0.0	0.0	0.0	7.5	6.1	0.0	0.0	11.6
GA	14	0.0	0.0	0.0	0.0	0.0	20.5	0.0	16.9	0.0	0.0	0.0	0.0	14.5	38.9	6.1	3.1	4.1
GA	15	0.0	0.0	0.0	0.0	0.0	11.8	0.0	32.2	0.0	0.0	0.0	0.0	11.2	36.9	4.1	3.9	3.9
GA	16	0.0	0.0	0.0	14.8	3.1	1.9	58.0	11.2	0.0	0.0	0.0	0.0	1.6	8.3	0.7	0.5	26.2
GA	17	0.0	0.0	0.0	0.0	17.2	0.0	25.4	19.5	0.0	0.0	0.0	0.0	20.6	14.6	1.8	0.9	13.4
GA	18	0.0	0.0	0.0	13.0	0.0	5.3	30.8	14.4	0.0	0.0	0.0	0.0	7.5	25.4	2.1	1.4	14.4
GA	19	0.0	0.0	0.0	47.9	0.0	3.1	0.0	22.1	0.0	0.0	0.0	0.0	6.7	16.0	3.0	1.2	11.0
GA	20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.3	0.0	0.0	0.0	0.0	21.5	35.4	2.8	0.0	4.3
GA	21	0.0	0.0	0.0	0.0	0.0	32.2	0.0	44.5	0.0	0.0	0.0	0.0	0.0	23.3	0.0	0.0	3.8
FL	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.3	0.0	0.0	0.0	0.0	0.0	54.7	0.0	0.0	1.8
FL	13	0.0	0.0	0.0	52.3	0.0	4.3	0.0	10.0	0.0	0.0	0.0	0.0	32.8	0.0	0.6	0.0	19.9
FL	14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.7	0.0	0.0	0.0	0.0	41.9	14.5	8.9	0.0	8.3
FL	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.6	0.0	0.0	0.0	0.0	26.2	21.5	11.6	2.0	7.8
FL	16	0.0	0.0	0.0	0.0	0.0	25.2	0.0	22.6	0.0	0.0	0.0	0.0	8.5	36.4	2.0	5.2	16.5
FL	17	0.0	0.0	0.0	0.0	0.0	23.1	0.0	4.2	0.0	0.0	0.0	0.0	14.6	49.3	6.2	2.6	12.1
FL	18	0.0	61.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.2	1.5	1.0	14.6
FL	19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.7	0.0	0.0	0.0	0.0	17.1	34.4	4.3	1.5	9.7
FL	20	0.0	0.0	0.0	0.0	0.0	43.2	0.0	11.0	0.0	0.0	0.0	0.0	44.2	0.0	1.6	0.0	5.9
FL	21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	56.9	0.0	0.0	0.0	0.0	0.0	37.9	0.0	5.2	2.5

[a]Harvest derivation was based on direct and indirect recoveries of all age and sex classes, except locals, that were each adjusted for band reporting rate and then population-weighted. The relative importance of each week's harvest, provided that it exceeded 1% of the total harvest in the harvest area, is shown by "Imp". Week 1 for all harvest areas begins on 1 September.

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A list of current *Resource Publications* follows.

133. A Handbook for Terrestrial Habitat Evaluation in Central Missouri, edited and compiled by Thomas S. Baskett, Deretha A. Darrow, Diana L. Hallett, Michael J. Armbruster, Jonathan A. Ellis, Bettina Flood Sparrowe, and Paul A. Korte. 1980. 155 pp.
134. Conservation of the Amphibia of the United States: A Review, by R. Bruce Bury, C. Kenneth Dodd, Jr., and Gary M. Fellers. 1980. 34 pp.
135. Annotated Bibliography for Aquatic Resource Management of the Upper Colorado River Ecosystem, by Richard S. Wydoski, Kim Gilbert, Karl Seethaler, Charles W. McAda, and Joy A. Wydoski. 1980. 186 pp.
136. Blackbirds and Corn in Ohio, by Richard A. Dolbeer. 1980. 18 pp.
137. Handbook of Acute Toxicity of Chemicals to Fish and Aquatic Invertebrates, by Waynon W. Johnson and Mack T. Finley. 1980. 98 pp.
138. Waterfowl and their Wintering Grounds in Mexico, 1937–64, by George B. Saunders and Dorothy Chapman Saunders. 1981. 151 pp.
139. Native Names of Mexican Birds, researched and compiled by Lillian R. Birkenstein and Roy E. Tomlinson. 1981. 159 pp.
140. Procedures for the Use of Aircraft in Wildlife Biotelemetry Studies, by David S. Gilmer, Lewis M. Cowardin, Renee L. Duval, Larry M. Mechlin, Charles W. Shaiffer, and V. B. Kuechle. 1981. 19 pp.
141. Use of Wetland Habitats by Birds in the National Petroleum Reserve—Alaska, by Dirk V. Derksen, Thomas C. Rothe, and William D. Eldridge. 1981. 27 pp.
142. Key to Trematodes Reported in Waterfowl, by Malcolm E. McDonald. 1981. 156 pp.
143. House Bat Management, by Arthur M. Greenhall. 1982. 30 pp.
144. Avian Use of Sheyenne Lake and Associated Habitats in Central North Dakota, by Craig A. Faanes. 1982. 24 pp.
145. Wolf Depredation on Livestock in Minnesota, by Steven H. Fritts. 1982. 11 pp.
146. Effects of the 1976 Seney National Wildlife Refuge Wildfire on Wildlife and Wildlife Habitats, compiled by Stanley H. Anderson. 1982. 28 pp.

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